



Land East of Leeds Road, Chidswell Environmental Statement - Volume 1

March 2020

Important notice: This Environmental Statement has been prepared by Deloitte Real Estate, with technical input from Re-form; Delta Simons; Patrick Parsons; Brooks Ecological; Pell Frischmann; and Cotswold Archaeology ("the Consultants"). Chapter 1, Volume 1 of this Environmental Statement sets out the parties responsible for preparing each Chapter and associated figures and appendices.

Although we have read the Consultants' reports for consistency and provide our observations based on our knowledge and experience, we accept no liability or responsibility for the Consultant's Reports and will not be responsible for the technical content of Chapters 7-14 and Chapter 15, Volume 1; nor Volume 2, nor the technical content of the associated separate Non-Technical Summary.

Contents

Table of Figures	4
Table of Appendices (Volume 2)	6
1 Introduction	8
2 EIA Methodology	15
3 Alternatives and Design Evolution	23
4 Site and Development Description	26
5 Construction Programme and Methodology	29
6 Socio-economics	33
7 Landscape and Visual Impacts	67
8 Heritage	143
9 Noise and Vibration	144
10 Air Quality	165
11 Flood Risk and Drainage	190
12 Contamination	213
13 Transport	235
14 Ecology	285
15 Type 1 Effects	313
16 Residual Effects	318

Table of Figures

Chapter	Figure
1 Introduction	N/A
2 EIA Methodology	N/A
3 Alternatives and Design Evolution	N/A
4 Site and Development Description	N/A
5 Construction Programme and Methodology	N/A
6 Socio-Economics	N/A
7 Landscape and Visual Impact	7.1 – Site Location 7.2 – Land Use 7.3 – Topography 7.4 – Landscape and Historic Designations 7.5 – Landscape character areas 7.6 – Character area photos 7.7 – Zone of Theoretical Visibility (ZTV) and viewpoint locations 7.8 – Landscape Analysis 7.9 – Indicative Proposed Development 7.10 – Viewpoint 1 7.11 – Viewpoint 2 7.12 – Viewpoint 3 7.13 – Viewpoint 4 7.14 – Viewpoint 5 7.15 – Viewpoint 6 7.16 – Viewpoint 7 7.17 – Viewpoint 8 7.18 – Viewpoint 9 7.19 – Viewpoint 10 7.20 – Viewpoint 11 7.21 – Methodology for Producing Views and Photomontages
8 Archaeology and Historic Environment	N/A
9 Noise and Vibration	N/A
10 Air Quality	10.1 – Monitoring Locations 10.2 – Road Vehicle Exhaust Emission Sensitive Receptor Locations 10.3 – Predicted Annual Mean NO ₂ Concentrations (µg/m ³) 10.4 – Predicted Annual Mean PM ₁₀ Concentrations (µg/m ³) 10.5 – ADMS-Road Inputs
11 Flood Risk and Drainage	N/A

Chapter	Figure
12 Contamination	12.1 – Mining Features and Preliminary Extent of Treatment
13 Transport	13.1 – Collision Data 13.2 – Local Collision Data
14 Ecology	14.1 – Site boundary and EZoI 14.2 – Approximate extent of the KWHN within proximity of the Site 14.3 – Phase 1 Habitat Plan
15 Type 1 Cumulative Effects	N/A
16 Summary of Residual Effects	N/A

Table of Appendices (Volume 2)

Chapter	Appendix
1 Introduction	1.1 Site Location Plan
2 EIA Methodology	2.1 – EIA Screening and Scoping Report 2.2 – Kirklees Metropolitan District Council’s EIA Scoping Response 2.3 – Committed Developments
3 Alternatives and Design Evolution	N/A
4 Site and Development Description	N/A
5 Construction Programme and Methodology	N/A
6 Socio-Economics	N/A
7 Landscape and Visual Impact	7.1 – Landscape and Visual Impact Assessment
8 Archaeology and Historic Environment	8.1 – Heritage Desk-Based Assessment 8.2 – Geophysical Survey Report
9 Noise and Vibration	9.1 – Baseline Noise Survey Details 9.2 – Acoustic Modelling and Predicted Noise Levels 9.3 – Glossary and Abbreviations
10 Air Quality	10.1 – Construction Phase Assessment Methodology 10.2 – Dispersion Modelling Input Parameters 10.3 – Dispersion Modelling Results
11 Flood Risk and Drainage	11.1 – Strategic Phasing Layout H18119-201
12 Contamination	12.1 – Phase 1 Geoenvironmental Desk Study Report 12.2 – Coal Mining Risk Assessment
13 Transport	13.1 – Transport Assessment 13.2 – Framework Travel Plan
14 Ecology	14.1 – HSI Assessment & Report 14.2 – Barn Owl Scoping Assessment & Report 14.3 – Ornithological Summary (Breeding Birds) 14.4 – Badger Assessment & Report 14.5 – Bat Roost Suitability Assessment & Report 14.6 – Bat Activity Survey 14.7 – Water Vole Report 14.8 – Reptile Survey 14.9 – Hedgerow Assessment & Report

	14.10 – Bat Roost Suitability Assessment 14.11 – Bat Emergence Survey
15 Type 1 Cumulative Effects	N/A
16 Summary of Residual Effects	N/A

1 Introduction

- 1.1 This Environmental Statement (ES) accompanies an application for Outline Planning Permission for the development of up to 1,354 dwellings, up to 35 hectares of employment generating use equating up to 122,500 sq. m. GEA, a local centre, a two-form entry primary school and associated works. The application to which this ES relates is submitted by C.C. Projects ("the Applicant").
- 1.2 The application site (hereafter referred to as "the Site") comprises approximately 112 hectares (ha) of undeveloped agricultural land and is located at Land East of Leeds Road, Chidswell, Dewsbury.
- 1.3 The Site is gently undulating, with two notable landscape features: a higher 'ridge' to the west of the centre, and a 'bowl-like' valley to the north, drained by the streams and ditches.
- 1.4 The Site does not contain any listed buildings, nor is it located within a Conservation Area. The nearest listed building is Haigh Hall (Grade II), located approximately 735m to the east of the Site.
- 1.5 There are no statutory environmental designations on the Site, however the Site is adjacent to two Local Wildlife Sites which are part of the Wildlife Habitat Network and are designated as Ancient Woodland (Dogloitch Wood and Dum Wood to the east).
- 1.6 The Proposed Development is outlined in detail at Chapter 4 of this Statement and is hereafter referred to as the "Proposed Development". A Site Location Plan is provided at Appendix 1.1.
- 1.7 The proposed overall quantum of development is set out at Table 1.1 below:

Table 1.1: Proposed Uses and Floorspace

Use	Parameters for Development
Site Area	c. 112 hectares
Residential Use	Up to 1,354 dwellings (Use Class C3) including upto 1 ha Use Class C2 and/or C3
Employment Use	35 ha of employment generating use (Use Class C2)
Educational Use	A two form entry primary school site comprising 2 ha (Use Class D1)
Commercial and Community Use	Local Centre (comprising Use Classes A1/A2/A3/A4/A5/D1/D2) providing 1,500 square metres of floorspace with no more than 500 square metres used for commercial use (Use Classes A1-A5)

- 1.8 The Proposed Development will be phased and the phasing timeline will be agreed through Reserved Matters submissions.
- 1.9 This ES sets out the findings of an Environmental Impact Assessment (EIA) carried out in respect of the Proposed Development of the Site.

Requirements for EIA

- 1.10 This section identifies the national, regional and local planning documents and policies of relevance to this environmental impact assessment. Please see the relevant referenced document for the full policy wording.
- 1.11 The EIA process is the mechanism by which development proposals are appraised in terms of their likely significant environmental effects, in addition to engineering and technical considerations.
- 1.12 The purpose of the EIA is to establish the nature of the Proposed Development and the environment in which it is likely to take place, during both construction and operational phases, so as to identify the likely significant effects on the environment. The assessment compares the existing situation at the start of the work (baseline) with the situation during demolition and construction, and when the Proposed Development is operational.
- 1.13 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations') require that any Proposed Development falling within the description of a 'Schedule 2 development' (as defined within the meaning of the EIA Regulations), will be subject to an EIA where such development is likely to have 'significant' effects on the environment by virtue of such factors as its nature, size or location (EIA Regulation Schedule 3).
- 1.14 The more environmentally sensitive the location, the more likely it is that the effects on the environment will be significant and will require an EIA. Certain designated sites are defined as sensitive areas and the thresholds and criteria outlined in Schedule 2 are not applied (Regulation 2(1)). These include Sites of Special Scientific Interest and European Sites; National Parks, the Broads and Areas of Outstanding Natural Beauty; and World Heritage Sites and scheduled monuments. The Proposed Development is not within a sensitive area.
- 1.15 The Proposed Development is considered likely to fall under the category of 'urban development projects' (Schedule 2, 10, (b)) where:
- The development includes more than 1 hectare of urban development which is not dwelling house development; or
 - The development includes more than 150 dwellings; or
 - The overall area of the development exceeds 5 hectares.
- 1.16 On this basis, the Proposed Development and Site exceeds the indicative applicable EIA Screening thresholds set out in the EIA Regulations and an EIA was therefore considered appropriate to test the likely significant effects of the Proposed Development.
- 1.17 A formal EIA Screening and Scoping Request was submitted to Kirklees Metropolitan District Council (KMDC) as the Local Planning Authority (LPA) on 27 September 2018, requesting confirmation that an EIA was required for the Proposed Development and the proposed scope of the EIA.
- 1.18 A response was received from the LPA on 25 May 2019 (Appendix 2.2). The technical chapters are therefore based on a scope of assessment that has been agreed with the relevant statutory consultees where possible.
- 1.19 In accordance with the EIA Regulations, this ES sets out the following information:
- A description of the development, including in particular:

- (a) a description of the location of the development;
 - (b) a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
 - (c) a description of the main characteristics of the operational phase of the development; and,
 - (d) an estimate, by type and quantity, of expected residues and emissions during the construction and operation phases.
- A description of the reasonable alternatives studied, 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.
 - A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
 - A description of the factors specified in regulation 4(2) likely to be significantly affected by the development.
 - A description of the likely significant effects of the development on the environment resulting from, inter alia:
 - (a) the construction and existence of the development, including, where relevant, demolition works;
 - (b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
 - (c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
 - (d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
 - (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
 - (f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
 - and,
 - (g) the technologies and the substances used.
 - A description of the likely significant effects on the factors specified in regulation 4(2) that covers the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.
 - A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
 - A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). Monitoring measures are considered necessary to monitor a significant adverse effect. Discussions will take place with KMDC post-determination of the planning application to determine whether the application should be subject to monitoring measures.
 - A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned.

- A non-technical summary of the information.
- A reference list detailing the sources used for the descriptions and assessments included.

Project Team

- 1.20 The EIA has been managed and the ES prepared by competent experts in accordance with Regulation 18 (5). The project team is experienced in the preparation of EIAs and specialise in their respective disciplines. Team members are appropriately trained and the work has been overseen by staff highly experienced and qualified in their field and the production of EIA work.
- 1.21 Deloitte Real Estate has significant experience and expertise in managing the EIA process, and hold the IEMA EIA Quality Mark. Deloitte Real Estate has managed the EIA process and the production of the ES for Land east of Leeds Road, Chidswell and has received technical input from a range of suitably qualified and experienced technical consultees.
- 1.22 Details of the EIA Technical Team are set out in Table 1.2 below.

Table 1.2: ES Project Team

Organisation	Expertise/Role	Qualifications
Deloitte Real Estate	Town Planning, EIA Co-ordination	RTPI, RICS, IEMA EIA Quality Mark
Re-form	Landscape and Visual Impact	Chartered Member LI
Cotswold Archaeology	Archaeology and Historic Environment	CIfA
Delta Simons	Air Quality, Noise and Vibration, Flood Risk and Drainage	Practitioner Member IEMA
Pell Frischmann	Transport	BA/BSc; MA
Patrick Parsons	Contamination	CGeol, MSc, BSc
Brooks Ecological	Ecology	BSc, MCIEEM

Organisation of the Environmental Statement

- 1.23 This ES comprises 16 chapters and is supported by figures (located at the back of each chapter within Volume 1) and technical appendices (within a separate Volume 2). A Non-Technical Summary ('NTS') of the full ES is provided as a separate standalone document.
- 1.24 Figures have been referenced using the chapter numbers as a prefix followed by the number of the figure within a given chapter. Appendices have been referenced in the same way but due to their size they are contained separately in Volume 2.
- 1.25 Table 1.3 sets out the structure of the ES.

Table 1.3: ES Structure

Chapter No.	Chapter Title	Description	Author
Volume 1			
1.	Introduction	Introduction to the ES, EIA requirements, details of the project team, ES organisation and availability.	Deloitte Real Estate
2.	EIA Methodology	Methods used to prepare each chapter, description of ES structure and content, generic significance criteria, scoping and consultation.	Deloitte Real Estate
3.	Alternatives and Design Evolution	Outline of the main alternatives considered by the Applicant.	Deloitte Real Estate
4.	Site and Development Description	Site description and details of the Proposed Development.	Deloitte Real Estate
5.	Construction Programme and Methodology	Outline details of anticipated programme for development and construction methodology.	Deloitte Real Estate
6.	Socio Economic	Assessment of the effects of the Proposed Development on socio-economic receptors.	Deloitte Real Estate
7.	Landscape and Visual Impact	Assessment of the visual impact of the Proposed Development on the landscape.	Re-form
8.	Archaeology and Historic Environment	Assessment of the effects of the Proposed Development on local heritage and archaeology.	Cotswold Archaeology
9.	Noise and Vibration	Assessment of effects of the Proposed Development relating to noise and vibration.	Delta Simons
10.	Air Quality	Assessment of existing air quality surrounding the Proposed Development and the likely impacts on air quality during construction and subsequent operation.	Delta Simons
11.	Flood Risk and Drainage	Assessment of effects of the Proposed Development relating to flood risk and drainage.	Delta Simons

Chapter No.	Chapter Title	Description	Author
12.	Contamination	Assessment of the existing ground conditions surrounding the Proposed Development and proposes potential mitigation measures if necessary.	Patrick Parsons
13.	Transport	Assessment of existing transport surrounding the Site in addition to the likely impacts on transport during construction and subsequent operation.	Pell Frischmann
14.	Ecology	Assessment of existing ecology on Site in addition to the likely impacts on ecology during construction and subsequent operation.	Brooks Ecological
15.	Type 1 Cumulative Effects	Review of inter project effects, which are combined effects arising from the Proposed Development on defined sensitive receptors.	Deloitte Real Estate
16.	Summary of Residual Impacts	Summary of the likely significant effects that remain after mitigation.	Deloitte Real Estate
Volume 2 – Technical Appendices			
Non-Technical Summary			

Other Documents

1.26 A number of other documents have been submitted to KMDC in support of the Planning Application. These include:

- Application Forms and Certificates prepared by Deloitte Real Estate;
- Parameter Plans prepared by Enjoy Design;
- Illustrative Masterplan prepared by Enjoy Design;
- Illustrative Phasing Plan prepared by Enjoy Design;
- Illustrative Density Plan prepared by Enjoy Design;
- Covering Letter prepared by Deloitte Real Estate;
- Planning Statement (including Sequential Test) prepared by Deloitte Real Estate;
- Design and Access Statement prepared by Enjoy Design;
- Masterplan Framework Document prepared by Enjoy Design;
- Tree Report and Arboricultural Impact Assessment prepared by Brooks Ecological;
- Coal Mining Risk Assessment prepared by Patrick Parsons;
- Draft Travel Plan prepared by Pell Frischmann;

- Health Impact Assessment prepared by Deloitte Real Estate;
- Market Assessment prepared by Gent Visick;
- Odour Assessment prepared by Delta Simons;
- Phase 1 Geo-Environmental Desk Study prepared by Patrick Parsons;
- Sustainability Statement prepared by Delta Simons.

Environmental Statement Availability

- 1.27 The ES is available for public viewing on KMDC's Planning Online website at the following address: <https://www.kirklees.gov.uk/beta/planning-applications/search-for-planning-applications/default.aspx> once the application has been submitted and validated.
- 1.28 The ES may be purchased in volumes, the costs of which are set out below:
- Volume 1: ES Main Text and Figures - £150
 - Volume 2: ES Appendices - £150
 - Non-Technical Summary (NTS) - £15
 - Full Copy (Volumes 1, 2 and 3) of the ES on CD - £15
- 1.29 For copies of any of the above, please contact Deloitte Real Estate:
- Land east of Leeds Road– Planning and EIA Team
Deloitte Real Estate
1 City Square
Leeds
LS1 2AL

2 EIA Methodology

Introduction

- 2.1 This Chapter sets out the methodology used to prepare each Chapter of the ES and describes its structure and content. In particular, it sets out the process of identifying and assessing the likely significant effects of the Proposed Development on the environment as defined in Chapter 1 and described in detail in Chapter 4.
- 2.2 Technical appendices also support this Chapter and consist of the following:
- EIA Screening and Scoping Report;
 - Kirklees Metropolitan District Council's EIA Scoping Response; and
 - Committed Developments (as outlined in Paragraphs 2.35 to 2.38 of this ES).

Legislation and Guidance

- 2.3 The ES has been prepared in accordance with EIA Regulations, which implemented European Council Directive No. 85/337/EEC as amended by Directive 2014/52/EU which entered into force on the 17 May 2017.
- 2.4 Reference has also been made to currently available good practice guidance in EIA including:
- The European Commission's numerous EIA guidance documents available here: <http://ec.europa.eu/environment/eia/eia-support.htm>
 - National Planning Practice Guidance – Department for Communities and Local Government (March 2014 and continuously updated as a 'live' resource)
 - Reference has been made to the Institute of Environmental Management and Assessment (IEMA) publications, including:
 - IEMA ES Review Criteria
 - IEMA Guidelines for Environmental Impact Assessment (2004)
 - IEMA Special Report into the State of Environmental Impact Assessment Practice in the UK (2011)
 - IEMA Shaping Quality Development (2015)
 - IEMA Delivering Quality Development (2016)
 - IEMA Delivering a Proportionate EIA (2017)
- 2.5 The ES has also had regard to the National Planning Policy Framework 2019 (NPPF). The NPPF sets out the Government's economic, environmental and social planning policies for England, articulating the Government's aspiration for sustainable development. The NPPF has been considered where it is relevant to EIA.
- 2.6 It is considered that there is no regional planning policy and guidance of relevance to this ES.

- 2.7 As relevant to the ES technical chapter's scope, methodology and assessment of effects, key local planning policy and guidance documents have been considered including the adopted Kirklees Local Plan (2019).
- 2.8 Any additional planning policy or guidance documents considered relevant have been identified within the relevant technical chapters.

Screening, Scoping and Consultation

- 2.9 The Proposed Development has been the subject of a scoping exercise to identify the likely significant effects on the environment that might arise, which has in turn informed the scope of the assessment.
- 2.10 The Scoping Report was submitted to KMDC on 27 September 2018 (Appendix 2.1) in order to agree the extent of the Environmental Statement to be submitted with the forthcoming Planning Application for Land east of Leeds Road, Chidswell.
- 2.11 In response, KMDC issued their Scoping Opinion on 25 May 2019 (Appendix 2.2). The Author of each Chapter has sought the opinion of relevant officers at KMDC, and statutory and non-statutory consultees as necessary. Compliance with the scope is detailed within the 'Assessment Methodology and Significance Criteria' section of each Technical Chapter.
- 2.12 In summary, the following consultation has taken place:
- Regular dialogue with senior officers at KMDC, including planning, housing, highways, landscape and economic developments officers;
 - Liaison with Yorkshire Water;
 - Liaison with Highways England in connection with the transport strategy;
 - Local residents and businesses within the vicinity of the Site were invited to public exhibition events, staffed by members of the Project Team, which provided the opportunity to find out more about the proposals and to offer feedback;
 - Liaison with the Chidswell Action Group;
 - Local Councillors (Batley East Ward and Dewsbury East Ward) were offered a briefing session on the proposals prior to the exhibition and individual meetings if they were unable to attend the exhibition;
 - Presentation to the Yorkshire Design Review Panel; and,
 - The emerging proposals were subject to an Environmental Impact Assessment Screening and Scoping process via correspondence with KMDC.
- 2.13 Further details relating to stakeholder engagement and public consultation are included within the Statement of Consultation submitted in support of the Application.

Non-Significant Effects

- 2.14 It is considered that the Proposed Development will not give rise to likely significant effects on the environment in respect of the following disciplines which therefore do not require inclusion in the ES. This has been agreed with KMDC through their scoping opinion based on an explanation for each discipline provided in the EIA Scoping Report in Appendix 2.1.
- Wind Microclimate;
 - Electrical Interference;
 - Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare;

- Arboriculture; and
- Odour.

- 2.15 Further correspondence with KMDC Planning Officers confirmed that Human Health would be dealt with in the required Health Impact Assessment, with the ES to refer to human health in its cumulative impacts chapter.
- 2.16 Additionally it was agreed that Climate Change would be dealt with primarily in a Sustainability Statement, however as climate change is highly relevant to flood risk this has been covered within the Flood Risk Assessment to a degree and within the cumulative impacts chapter.

Approach to Technical Studies

- 2.17 Various technical studies were commenced at an early stage in the development process. The findings of the baseline environmental studies have played an important role in the design of the Proposed Development by defining the environmental sensitivities, constraints and opportunities associated with the Site.
- 2.18 The technical studies have been undertaken in accordance with current best practice. Specific guidance used is referenced within each of the respective assessment chapters.
- 2.19 The majority of assessments involved consultations with statutory and non-statutory bodies, desk-based research, site inspections and surveys, impact prediction and mitigation.
- 2.20 The assessment and conclusions of the ES are based on the description of the Proposed Development provided in Chapter 4.

Structure of Technical Chapters

- 2.21 Each technical chapter of the ES (Chapters 6 to 16) has been prepared broadly in line with Table 2.1.

Table 2.1: Structure of ES Technical Chapters

Technical Chapter Structure	
Introduction	Each of the technical chapters begins with an introduction providing context to the EIA completed.
Policy Context	This section includes a summary of legislation and of national and local policies relevant to the environmental discipline and explains its purpose in the context of the Proposed Development and the ES.
Assessment Methodology and Significance Criteria	This section describes the method or approach employed in the assessment of impacts, the criteria against which the significance of effects has been evaluated, the sources of information used and any technical difficulties encountered. Relevant legislation is also identified.
Assumptions and Limitations	This section describes any assumptions and limitations which have been made that are relevant to the environmental disciplines.
Baseline Conditions	This section describes and evaluates the baseline environmental conditions i.e. the current situation and anticipated changes over time assuming the Site remains unchanged. This is a critical part of the EIA process as it provides a measure against which potential environmental effects can be assessed.

Technical Chapter Structure	
Identification and Evaluation of Key Impacts	This section identifies the likely significant effects on the environment resulting from the Proposed Development. A description of the likely effects of the Proposed Development and an assessment of their predicted significance is provided. The assessment of effect significance has been undertaken using appropriate national and international quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.
Mitigation Measures	One of the main aims of the EIA process is to develop suitable mitigation measures to avoid, reduce or compensate for any significant adverse effects of a project. This section of each technical chapter describes the measures which would be implemented to mitigate potential adverse effects. Where possible, enhancement measures have also been proposed.
Cumulative Effects	This section considers the cumulative effects of the Proposed Development identified within the vicinity of the Site. Any likely significant effects on the environment arising in this respect are set out in this section. There are two distinct types of cumulative effects: Type 1 - Cumulative effects are the interactions between effects of the Proposed Development on a single receptor. These are addressed in Chapter 16. Type 2 - Cumulative effects are those that arise from incremental changes caused by other consented or reasonably foreseeable activities ('committed developments') together with the Proposed Development.
Residual Effects	The residual effects, i.e. the remaining effects of the Proposed Development assuming implementation of the proposed mitigation measures, have been estimated and presented. The methods used to make these estimates are described and proposed methods of treatment for any residual effects have been identified and quantified where possible.
Reference List	A reference list is provided within each chapter as relevant.
Summary	Each technical chapter concludes with a brief summary outlining the likely residual effects of the Proposed Development.

- 2.22 Chapter 5 provides information to allow the construction phase of the Proposed Development to be assessed by the disciplines set out in Chapters 6 to 14.

Assessment and Evaluation of Likely Significant Effects

- 2.23 The assessment of effect significance has been undertaken using appropriate national and international quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.

Magnitude

2.24 The methodology for determining the scale, or magnitude of effect is set out in Table 2.2.

Table 2.2: Methodology for Assessing Magnitude

Magnitude of Impact	Criteria for Assessing Effect
Major	Total loss or major/substantial alteration to key elements/features of the baseline 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.

Sensitivity

2.25 The sensitivity of a receptor is based upon the relative importance of the receptor using the scale in Table 2.3.

Table 2.3: Methodology for Assessing Sensitivity

Sensitivity	Examples of Receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Medium	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, or is of low or local importance.

Significance

2.26 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be positive or negative. Table 2.4 below shows how magnitude and sensitivity interact to derive effect significance.

Table 2.4: Methodology for Assessing Significance

Magnitude	Sensitivity		
	High	Medium	Low
Major	Major Adverse/Beneficial	Major-Moderate Adverse/Beneficial	Moderate-Minor Adverse/Beneficial
Moderate	Major-Moderate Adverse/Beneficial	Moderate Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate-Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor-Negligible
Negligible	Negligible	Negligible	Negligible

- 2.27 The above magnitude and significance criteria have been provided as a guide for technical specialists to assess impact significance. Where discipline specific methodology has been applied that differs from the generic criteria above, this has been clearly explained within the given chapter under the heading of 'Assessment Methodology and Significance Criteria'.
- 2.28 For the purpose of this ES, an effect will be considered to be 'significant' if it is classed as either 'moderate' or 'major', unless otherwise specified within the technical chapter ('minor' or 'negligible').

Assumptions and Limitations

- 2.29 The principal assumptions that have been made and any limitations that have been identified in preparing the ES are set out in each technical chapter. General assumptions include the following:
- All of the principal land uses adjoining the Site remain. Where redevelopment proposals have been granted Planning Permission, or are identified as reasonably foreseeable activities ('committed developments') the effect of those proposals are considered as part of the Cumulative Impacts;
 - Baseline conditions have been established in 2019 from a variety of sources, including historical data, but due to the dynamic nature of certain aspects of the environment conditions will change during the Proposed Development;
 - As the application is for Outline Planning Permission the assessments within the technical chapters have been based on the parameter plans;
 - Information received from third parties is complete and up to date;
 - The various stages of the Proposed Development will comply with minimum environmental standards, consistent with current legislation, practice and knowledge;
 - Assessments are based upon, and conclude, the full extent of the Proposed Development as defined by the description of development set out in Chapter 4, Site and Development Description thereby providing a "worst case" assessment;
 - Construction and demolition methods and phasing will follow the timetable and methods set out in Chapter 5, Construction Programme and Methodology.
 - Conditions will be attached to the Planning Permission that will control disturbance during the Proposed Development; and

- Necessary off-site services infrastructure for the Proposed Development will be provided by statutory undertakers.

Baseline Conditions

- 2.30 Each technical chapter includes a section which describes and evaluates the baseline environmental conditions (i.e. the current situation and anticipated changes over time assuming the Site remains unchanged). Baseline data has been obtained from a variety of sources, including published documents, maps, historical information and site survey data. Given the complex nature of the Site and surroundings, each technical chapter (Chapters 6 to 14) includes a clear description of what is assumed as the baseline against which the assessment is being made.
- 2.31 The method used to obtain baseline information, where relevant and possible, has been clearly identified within each technical chapter and agreed in advance with statutory consultees.

Mitigation

- 2.32 Any significant adverse environmental effects have been considered for mitigation at the design stage and, where practicable, specific measures have been put forward. Measures have been considered based on the following hierarchy of mitigation:
- Avoidance.
 - Reduction.
 - Compensation.
 - Remediation.
 - Enhancement.
- 2.33 Where the effectiveness of the mitigation proposed has been considered uncertain, or where it depends upon assumptions of operating procedures, data and/or professional judgement has been introduced to support these assumptions.
- 2.34 Mitigation recommended during the construction phase will be set out in the Construction Management Plan (CMP) to be secured through planning condition, agreed with KMDC prior to the commencement of work, and implemented throughout the duration of the works. Outline mitigation measures to be included in a future CMP are set out in Chapter 5: Construction Programme and Methodology.
- 2.35 Mitigation to be implemented during the operational phase will be secured through planning conditions and obligations.

Residual Effects

- 2.36 The likely significant effects on the environment, assuming the successful implementation of mitigation measures proposed, have been estimated within each chapter. These are termed 'residual effects'.

Cumulative Effects

- 2.37 The ES considers the potential for likely significant effects on the environment resulting from permitted or reasonably foreseeable activities or developments in the area, which could lead to potentially significant cumulative effects in conjunction with the Proposed Development ('Committed Developments').
- 2.38 These include:
- Approved but uncompleted projects;

- Plans or projects for which an application has been made and which are under consideration by the consenting authorities; and,
- Certain projects which are reasonably foreseeable, i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative effects.

2.39 A search of KMDC's planning application database and knowledge of the area has identified a number of schemes for which cumulative effects are considered likely. Further information on the committed developments and a map showing their location is set out at Appendix 2.3.

2.40 Each technical chapter (Chapters 6-14) has assessed the potential for likely significant effects on the environment as a result of the above committed developments, together with the Proposed Development.

In addition, Chapter 16 assesses the Type 1 Cumulative effects, also known as inter-project effects.

Objectivity

2.41 The technical studies undertaken within the ES have been progressed in a transparent, impartial and unbiased way with equal weight attached, as appropriate, to beneficial and adverse effects. Where possible, this has been based upon quantitative and accepted criteria together with the use of value judgements and expert interpretations.

2.42 The assessment has been explicit in recognising areas of limitation within the ES and any difficulties that have been encountered, including assumptions upon which the assessments are based. Where appropriate, the assessment of significance has been given confidence levels.

3 Alternatives and Design Evolution

Introduction

- 3.1 Regulation 18(3) and Paragraph 2 of Schedule 4 of the EIA Regulations requires the Applicant to provide an outline of the reasonable alternatives studied by the developer which are relevant to the Proposed Development and its characteristics and an indication of the main reasons for the choice made, taking into account the environmental effects.
- 3.2 The form of the Proposed Development has been influenced by a range of factors, including location, surrounding land use and input from KMDC, statutory and non-statutory consultees and other stakeholders.
- 3.3 This chapter reviews the principal land use and siting options explored and the reasoning for the selection of the current design for the Proposed Development which forms the subject of assessment within the ES.
- 3.4 This chapter considers the following four options in context of the existing Proposed Development:
- The 'do nothing' alternative where the Proposed Development is not progressed.
 - Alternative locations for the Proposed Development.
 - Alternative uses for the Site.
 - Alternative design/layout for the Proposed Development in the context of the design evolution.

The 'do nothing' Alternative

- 3.5 The 'do nothing' scenario refers to the option of leaving the Site in its current state which is agricultural fields.
- 3.6 The Site is identified in the Leeds City Region Strategic Economic Plan and in the Kirklees Economic Strategy as playing a key role in helping to transform Dewsbury and the Site is allocated for development in the Local Plan.
- 3.7 If the Site is left in its current state, this will result in an important component of the Local Plan not being delivered, and thus planned housing delivery and economic growth in the local authority area is likely to be jeopardised.
- 3.8 Overall, it is considered that the 'do nothing' alternate option will be inferior to the Proposed Development, which will boost economic activity and housing delivery in the area and will support significant social improvements on site and up to a regional scale. Full details of the socio-economic impact are set out in Chapter 9 (Socio-Economic Impact) of this ES.

Consideration of Alternative Locations

- 3.9 The Site is located to the east of the A653 Leeds Road dual carriageway, which is a strategic corridor between Dewsbury and Leeds. It lies in close proximity to the A638 Wakefield Road, which in turn links with the M1 Motorway Junction 40 to the east of the Site.
- 3.10 Residential and employment generating uses in this location are supported in local policy contained within the adopted Kirklees Local Plan (site reference MXS7). To this effect, the

Site has been supported for development by various documents produced by KMDC and strategic authorities within the Leeds City Region area.

- 3.11 In addition to this clear policy support, the Site is also well located for the Proposed Development. Although the Site lies beyond the existing physical boundary of Woodkirk, there are no statutory landscape or ecological designations relating to the Site itself which may restrict development. The principle of development in this location has been agreed with the Local Planning Authority, as indicated by the local plan site allocation. This may not be the case if considering alternate sites. Therefore the Site is situated in a suitable location for mixed use development.
- 3.12 Therefore, this Chapter does not consider alternative sites within the context of the planning application as there is an identified need to develop this specific site as a key contributor to the realisation of the local plan and other Leeds City Region policies and objectives.

Consideration of Alternative Uses for the Site

- 3.13 Due to the size of the Site, it is considered that the only feasible alternative uses for the Site in relation to the Proposed Development are commercial development uses, such as: retail and leisure; logistics; and, industrial/business park.

Retail and Leisure

- 3.14 *Policy LP13 Town centre uses* states that within Kirklees, main town centre uses shall be located within defined centres (principal town centres, town centres, district centres, and local centres), as shown on the Policies and Town Centre Maps, and as detailed in the shopping centre hierarchy and then in accordance with the sequential test. Proposals that have a significant adverse impact on the vitality and viability of an existing centre, or compromise the role and function of an existing centre will not be supported. It can be reasonably assumed that a development providing up to 112 ha of retail will have an adverse effect on the vitality and viability of nearby existing town, district and local centres.

Logistics

- 3.15 Logistics development is not preferable as the visual impact of substantial development would have a negative impact on the character of Woodkirk and Chidswell. Logistics development would increase the trips undertaken by heavy goods vehicles in the area which would have a negative impact on the capacity of the highways network and air quality.
- 3.16 Additionally the employment requirements of the district have already been assessed through the Local Plan adoption and the most appropriate locations have been identified for development.

Industrial Development

- 3.17 Industrial development would result in the issues identified in relation to retail and leisure and logistics development. It can be reasonably assumed that 112 ha of industrial development could have an adverse effect on the vitality and viability of nearby existing local centres.
- 3.18 Additionally, industrial development is not preferable as the visual impact would be negative and affect the character of Woodkirk and Chidswell. The increased heavy goods vehicle movements as a result of the development would also result in concerns over the capacity of the highways network and have negative impacts on air quality.
- 3.19 Furthermore the employment requirements of the district have already been assessed through the Local Plan adoption and the most appropriate locations have been identified for development. The employment uses included within the Proposed Development will contribute towards the assessed need.

Summary

- 3.20 The Site is allocated for mixed use development in the Kirklees Local Plan (adopted February 2019) (KLP19) (site reference MXS7). Therefore the Site cannot be solely developed for commercial development uses as this would be contrary to adopted local planning policy, and detrimental to the delivery of the plan.
- 3.21 A large part of the Site is proposed for residential development as required by policy KLP19. The Site has therefore been identified by the LPA as being within a suitable and attractive market location. The calculated objectively assessed need for dwellings in KMDC's administrative area results in the delivery of an average of 1,730 dwellings per annum over the plan period to 2031. The submitted Parameters Plan has an indicative dwelling capacity of up to 1,354 units; therefore, developing the land for a non-residential use would have a detrimental effect on whether KMDC can meet their housing delivery requirement over the plan period.

Consideration of Alternative Scale and Massing

- 3.22 Different scales and massing options were considered as part of the design process, the aim of which was to maximise the suitable use of the Site, be appropriate to the local character, and minimise any negative impacts on adjacent land uses and amenity.
- 3.23 The height and maximum extent of development has been fixed by the Developable Area and Use Parameter Plan (drawing ref: 00-201 Revision F) and the Maximum Building Heights Parameter Plan (drawing ref: 00-203 Revision F) and are considered to be in keeping with the local character and scale. The final scale will be determined at Reserved Matters stage.
- 3.24 The Design and Access Statement submitted with the application details how the design of the Proposed Development has been formulated. The options considered for the development reflected the context of the Site and took into account the environmental impacts arising. . The design considered the environmental impacts, as assessed in depth within this ES.

4 Site and Development Description

Introduction

- 4.1 This Chapter includes a description of the Site, its surrounding context, a detailed description of the Proposed Development as well as consideration of the Site's suitability for the Proposed Development.
- 4.2 Please refer to the Illustrative Masterplan (Drawing Reference: 18008_00_001R), Parameter Plans (Drawing References: 18008-00-201F, 18008-00-202F, 18008-00-203F, 18008-00-204H, 18008-00-205E), and Design and Access Statement (DAS) submitted in support of the application for further details.

Site Description

- 4.3 The Site covers an area of approximately 112 ha and comprises a mixture of arable and pastoral agricultural land that is divided by hedgerows into several fields. The Site has not been previously developed.
- 4.4 The Site is located to the east of the A653 Leeds Road dual carriageway, which is a strategic corridor between Dewsbury and Leeds. In the immediate vicinity of the Site, Leeds Road runs in a north-south direction, adjoining the A638 Wakefield Road and Junction 28 (the Tingley Interchange) of the M62 Motorway to the north. The A638 Wakefield Road links with the M1 Motorway Junction 40 to the east of the Site.
- 4.5 Suitable access for the Site can be gained from Leeds Road (A653), Chidswell Lane and Owl Lane.
- 4.6 There are neighbouring residential properties to the east of the Site. The surrounding area is characterised predominately by agricultural land, with a mix of early and late century bungalows and semi-detached properties fronting the main arterial routes.
- 4.7 As per the Agricultural Land Classification Map for the Yorkshire and the Humber region (ref 10-111c), the Site is characterised as Grade 3 Agricultural Land.
- 4.8 There are no statutory heritage, landscape or ecological designations relating to the Site.
- 4.9 As per the Environment Agency Flood Map, the Site is characterised as Flood Zone 1 and therefore the Site is at low risk of fluvial flooding.
- 4.10 The Site lies within Dewsbury East ward and Batley East ward (KMDC) and is located in close proximity to Woodkirk which offers a range of services and facilities to meet the daily needs of its residents. Woodkirk provides a primary school, a secondary school, convenience store and a public house.
- 4.11 The Site is included within an allocation for mixed use development in the Kirklees Local Plan (adopted February 2019) (KLP19) (site reference MXS7). The gross site area for the allocation totals 120.78 ha. The policy states:
- The allocation is for mixed use development comprising housing and employment land.
 - A landscape character assessment has been undertaken for this site which should be considered in the development masterplan/ site proposals.

- The location is identified in the Leeds City Region Strategic Economic Plan and in the Kirklees Economic Strategy and the site will play a key role in helping transform Dewsbury. Proposals should indicate how the place shaping strengths, opportunities and challenges can be addressed through reference to policies in the Local Plan, the Dewsbury Strategic Framework and other regeneration and urban renaissance strategies and initiatives.
- Residential amenity will need safeguarding through sensitive siting of buildings and landscape buffer areas.
- A buffer will be required to protect the ancient woodlands at Dum Wood and Dogloitch Wood.

Description of the Proposed Development

4.12 The description of development is as follows:

"Outline planning application (all matters reserved except access), for the demolition of existing dwellings and the development of a phased, mixed use scheme comprising residential development (up to 1,354 dwellings, including up to 1 hectares of retirement living), employment development, residential institution (C2/C3) development, a local centre (comprising A1/A2/A3/A4/A5/D1/D2 uses), primary school, green space, access and other associated infrastructure."

4.13 The Application includes Parameters Plans which set the parameters for a future detailed scheme and reflect the outcome of a range of technical assessments. There are five Parameter Plans which set out the following:

- (18008-00-201F) – Proposed Parameter Plan, Developable Area & Use – sets out the extent of the proposed land parcels and their intended uses.
- (18008-00-203F) – Proposed Parameter Plan, Maximum Building Heights – sets the maximum height for proposed buildings, including dwellings, employment plots and the local centre which will be detailed as part of future Reserved Matters submissions.
- (18008-00-205E) – Proposed Parameter Plan, Access – identifies the Site's vehicular access points and spine road corridors.
- (18008-00-202F) – Proposed Parameter Plan, Blue Infrastructure – identifies the broad locations for blue infrastructure.
- (18008-00-204H) – Proposed Parameter Plan, Green Infrastructure – identifies the broad locations for green infrastructure.

4.14 The details of development will be determined by subsequent submissions of Reserved Matters by the future developer(s) of the Site. A development partner will be identified following the granting of any Outline Planning Permission.

4.15 An Illustrative Masterplan (drawing ref: 18008_00_001R), is provided which incorporates the development principles set out on the Parameters Plan, and takes into account the conclusions of a range of technical reports prepared for the Site, in showing how the Site might be suitably and appropriately developed within the parameters. It includes:

- Residential use for up to 1,354 dwellings.
- Development of up to 35 hectares of employment generating uses equating up to 122,500 sq. m. GEA.
- A local centre.

- Development of a two form entry primary school with early years provision comprising 2 ha (Use Class D1).

5 Construction Programme and Methodology

Introduction

- 5.1 This chapter of the ES describes the proposed construction programme and provides a review of the potential impacts of the construction works along with reviewing potential mitigation measures.
- 5.2 A primary aim throughout the proposed construction works will be to minimise the impact of the works on the surrounding environment (including neighbours, neighbouring buildings, local infrastructure etc). This will be achieved via close collaboration between all project team members.
- 5.3 This chapter is prepared at the time of the Outline Planning Application. Further detail on the programme will be available once a main contractor has been engaged following Reserved Matters applications. [In relation to the commentary on potential impacts and proposed mitigation, more detailed proposals will also be provided once a Main Contractor has been appointed. It is anticipated that the production of a Construction Management Plan (CMP) will be secured through a condition on the Outline Planning Permission, which will require the approval of a CMP for a phase before commencement of that phase. The CMP will cover all of the matters below.

Programme

- 5.4 The development programme, including obtaining Reserved Matters and undertaking Site preparation works, is anticipated to be split into a number of phases and the full development is anticipated to complete within 10 – 15 years.

Construction Methodology

- 5.5 The following section of the document looks at the construction methodology and in particular focuses on the potential impacts of the construction works and the potential measures necessary to mitigate these impacts.
- 5.6 Any works outside of normal working hours would be via prior agreement with the Council. It is noted that part of the Site is located in close proximity to existing residential developments. The restrictions on working hours will be advised to potential contractors at the procurement stage and will be a term of any construction contracts.

Traffic Management & Temporary Closures

- 5.7 A Traffic Management Plan will be developed in due course by the Main Contractor. This will take into consideration the site conditions and surrounding roads, and will set out principles for vehicle/pedestrian access, any road/footpath closures required, and principles for deliveries and vehicle movements.
- 5.8 The Site is adjacent to Leeds Road and Chidswell Lane. There is an existing network of Public Rights of Way within the Site. The proposed vehicular access points to the Site are via Leeds Road, Chidswell Lane and Owl Lane.
- 5.9 Applications for footpath / road closures or any scaffold licences will be lodged by a main contractor (when appointed) with KMDC and subject to their approval. A site logistics plan for the construction phase is also expected to be provided.

- 5.10 There will also be plant / construction vehicles operating on the Site and risks associated with this will be considered as part of the Traffic Management Plan, which will be prepared by the Main Contractor (when appointed).
- 5.11 There may be specific vehicle movements to/from the Site requiring special arrangements – for example where large plant equipment is being delivered to Site. The Main Contractor would be responsible for any temporary road closures, escort vehicles or similar.
- 5.12 Vehicle movements will be timed to avoid rush hour / busy periods. No vehicles will be allowed to wait on surrounding streets before attending site to avoid traffic build up/blockages. Suppliers will be made aware of transport routes to and from the site and all deliveries will be pre-booked for a certain delivery time. Banksman will direct delivery vehicles to the correct site entrance.
- 5.13 Trained and competent banksman will control all vehicular movements in and around the site.
- 5.14 The Main Contractor will be responsible for liaising with all neighbours throughout the works and advising on vehicle movements, and in particular any large / abnormal deliveries, etc.

Site compound and storage

- 5.15 All plant and materials will be stored within the Site. The Main Contractor will be responsible for the management of plant and materials on Site. Deliveries of materials will be managed to ensure that the right materials are available at the right time. It will be ensured that there is no excessive build-up of materials to a point whereby storage issues on Site affects day to day operations.
- 5.16 Details of on-site welfare will be provided as part of the CMP. On-site facilities will include toilets, offices, canteen/ mess facility, drying room, hot and cold water, drinking water and facilities to heat meals.

Waste Management and Recycling

- 5.17 A Site Waste Management Plan, a strategy for dealing with waste and recycling will be implemented by the Main Contractor, in accordance with the Site Waste Management Plans Regulation 2008 (repealed). This will include details of the following:
- Mitigating the amount of waste generated.
 - Re-use of materials where possible.
 - Segregating and recycling materials.
 - Disposing of waste generated in a suitable manner at a suitable facility.
- 5.18 During the construction works, waste material arising will ideally be cleared on a daily basis. Bins will be provided at every floor level close to operations to allow operatives to deposit waste on a daily basis. Waste will then be separated at ground level in advance of recycling / removal from site.

Crane

- 5.19 At the time of the planning application a crane has not been specified for the works. This will be developed in due course with a Main Contractor and crane locations will be provided.
- 5.20 All oversailing licenses will be agreed with the relevant land owner prior to the relevant works commencing on site. Any restrictions imposed as part of these licenses will be considered and adhered to throughout the works.

- 5.21 The use of the crane and all associated operations will be in accordance with the requirements of the Lifting Operations and Lifting Equipment Regulations 1998, BS 7121-1 Code of Practice for the Safe Use of Cranes and GE700/D3.
- 5.22 The Main Contractor will be responsible for ensuring that the crane operator has adequate training, qualifications and experience relevant to the type of work being carried out.
- 5.23 A safe system of work will be in place for all crane and associated operations.

Dust Suppression

- 5.24 Dust is a general construction issue and will need to be managed throughout the duration of the project.
- 5.25 Dust will be controlled in accordance with the Air Quality assessment in Chapter 10 of this ES.
- 5.26 The Main Contractor and relevant sub-contractors will be responsible for controlling dust. This will be done via good housekeeping and proactive management on site. Each work activity will need to be reviewed for dust risk prior to the works commencing. Subsequently, suitable controls and mitigation can be implemented to reduce dust risk accordingly. Minimising dust generation will be key and this can be controlled via the use of suitable materials, equipment and appropriate work techniques.

Noise

- 5.27 Another general construction issue is noise and this will need to be managed and mitigated as far as reasonably possible.
- 5.28 The construction activities likely to cause significant noise pollution include any excavating, cutting and breaking. In addition, plant movement around site has the potential to be a noisy activity. Any potentially noisy activities will be pre-assessed, and the potential impact on both construction operatives and the local environment (i.e. neighbours) considered.
- 5.29 The Main Contractor will be expected to adhere to and comply with The Control of Noise at Work Regulations 2005 and the British Standard BS 5228 Noise and Vibration Control on Construction and Open Sites.
- 5.30 Noise monitoring will be undertaken as required and where noise levels exceed the agreed limits the appropriate action will be taken. Engagement with KMDC will be undertaken as required to agree the requirements with regard to noise levels during construction works.
- 5.31 Furthermore, the Main Contractor will liaise with any parties (i.e. neighbours) likely to be affected by noise as required at the relevant stage of the project and will seek to accommodate requirements as far as reasonably possible without delaying the process of works on site. Maintaining neighbour relations will be a key task of the Main Contractor.
- 5.32 As with the dust control process described above it will be necessary to review each work activity being carried out and proximity to neighbours to assess the potential noise impact and determine the mitigation to be implemented. Noise mitigation measures/techniques include the following:
- Plant, machinery and tools fitted with silencing/anti-vibration equipment and/or silencers/mufflers where appropriate.
 - Consideration given to low noise work techniques (i.e. control during scaffold erection/dismantle to prevent banging).
 - Arranging deliveries during working hours.
 - Noisy works to take place at pre-agreed times and/or during agreed working hours and not out of hours.

- Noisy equipment sited away from neighbouring buildings where possible and turned off when not in use.
- Use of acoustic barriers / screens where appropriate to break the noise path.
- Proper maintenance of plant and equipment to ensure it is working correctly and efficiently.

5.33 The key issue in this regard is awareness, and ensuring that the operatives carrying out works are aware of the noise requirements and the mitigation available.

Security

5.34 The developer will confirm the site set up following Reserved Matters. Site access is anticipated to be via designated vehicle/pedestrian entrances. Visitors will be signed in/out by the Main Contractor and escorted around the site as required.

Summary

5.35 The Construction Design and Management Regulations 2015 will apply to this project and all appropriate controls and systems will be in place to comply with the standards of the Regulations and associated guidance.

5.36 Every stage of the project will be pre-risk assessed and appropriate controls applied, sub-contractors will be pre-vetted and will be subject to extensive pre-contract requirements of information transfer and risk assessment.

5.37 The Main Contractor will at the earliest possible stage of the project enter into dialogue with the all relevant parties including neighbours to ensure there is effective coordination throughout all stages of construction.

6 Socio-economics

Introduction

- 6.1 This chapter has been prepared by Deloitte Real Estate who are full members of RTPI and IEMA. It assesses the likely significant effects of the Proposed Development on the environment with respect to socio-economic considerations.
- 6.2 It describes the planning policy context, methods used to assess the effects, the baseline conditions, and the potential effects of the Proposed Development during both its construction and operational phases. It also includes discussion of the mitigation measures required to mitigate any likely significant adverse effects, and measures to maximise the opportunities presented by the Proposed Development.

Planning Policy Context

- 6.3 This section identifies the national and local planning documents and policies of relevance to this socio-economic impact assessment. Please see the relevant referenced document for the full policy wording.

National Planning Policy

National Planning Policy Framework (NPPF) (2019)

- 6.4 The overarching aim of the NPPF¹ is to simplify the planning system so that schemes which are in accordance with the Development Plan are granted permission. There is a presumption in favour of sustainable development to assist economic growth as long as there are not unacceptable adverse effects.
- 6.5 The "*Building a strong, competitive economy*" section of the NPPF is particularly relevant. It states that significant weight should be placed on the need to support economic growth in order to create jobs and prosperity, and allow each area to build on its strengths.
- 6.6 Paragraph 80 identifies that to help economic growth, local planning authorities should plan proactively to meet the development needs of business and support an economy fit for the challenges of the future.
- 6.7 "*Promoting healthy and safe communities*" is also a key consideration. Paragraph 92 states that:

To provide the social, recreational and cultural facilities and services the community needs, planning policies and decisions should:

- plan positively for the provision and use of shared space, community facilities (such as local shops, meeting places, sports venues, cultural buildings, public houses and places of worship) and other local services to enhance the sustainability of community and residential environments;*
- take into account and support the delivery of local strategies to improve health, social and cultural well-being for all sections of the community;*
- guard against the unnecessary loss of valued facilities and services, particularly where this would reduce the community's ability to meet its day-to-day needs;*

¹ National Planning Policy Framework (2019), DCLG <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

- *ensure that established shops, facilities and services are able to develop and modernise in a way that is sustainable, and retained for the benefit of the community; and*
- *ensure an integrated approach to considering the location of housing, economic uses and community facilities and services.*

Local Planning Policy

Kirklees Local Plan 2019

- 6.8 The Kirklees Local Plan ("KLP19") sets the spatial vision, objectives and strategic growth to 2031. The Local Plan covers the administrative area of Kirklees Metropolitan District Council except for that part within the Peak District National Park. The aim of the Local Plan is to set out the key elements of the planning framework for Kirklees, and explain the approach to its long term physical development to achieve the Council's vision of what sort of place Kirklees wants to become.
- 6.9 The Local Plan is set out in two parts: Part 1 'Strategy and Policies' which contains the spatial strategy and development management policies and Part 2 'Allocations and Designations' which sets out the allocations and designations included in the Local Plan.
- 6.10 The Site is included within an allocation for mixed use development in the KLP19 (site reference MXS7). The gross site area for the allocation totals 120.78 ha.
- 6.11 Relevant elements of the key Local Plan policies pertinent to this assessment of socio-economic effects are identified below.

Residential Development

- 6.12 **Policy LP7: Efficient and effective use of land and buildings** outlines the expectations for housing density. Developments should achieve a net density of at least 35 dwellings per hectare, where appropriate.
- 6.13 **Policy LP11: Housing Mix and Affordable Housing** states that all proposals for housing will be of high quality and design and contribute to creating mixed and balanced communities in line with the latest evidence of housing need. For schemes of more than 10 dwellings, the housing mix should reflect the proportions of households that require housing, achieving a mix of house size and tenure. The policy sets the affordable housing requirement at 20% and this percentage will be sought unless it can be demonstrated through viability evidence that the required figure would render the scheme unviable.
- 6.14 **Policy LP20: Sustainable travel** states that new development will be expected to be located and designed to reduce the need to travel. Proposals will be required to facilitate the needs of the following user hierarchy: a) pedestrians; b) cyclists; c) public transport; d) private vehicles.
- 6.15 **Policy LP21: Highways and access** states that proposals shall demonstrate that they can accommodate sustainable modes of transport and be accessed effectively by all users. Adequate information and mitigation measures are needed to avoid any detrimental impact on highway safety and the local highway network.
- 6.16 **Policy LP22: Parking** explains that car parking provision in new developments will be determined by the availability of public transport, the accessibility of the site, location of

the development, local car ownership levels and the type, mix and use of development. Provision should be made to meet the needs of cyclists for cycling parking.

- 6.17 **Policy LP24: Design** expects development to be of high quality design and provide a high standard of amenity for future and neighbouring occupiers. High levels of sustainability should also be incorporated.

Employment Use Development

- 6.18 **Policy LP9: Supporting skilled and flexible communities and workforce** states that the council will work with partners to accelerate economic growth through the development of skilled and flexible communities and workforce in order to underpin future economic growth to deliver the Kirklees Economic Strategy. The council will seek to secure an agreed training or apprenticeship programme with applicants where development meets the thresholds of 3,500 sq.m. or more of business or industrial floorspace, or housing developments which would deliver 60 dwellings or more.
- 6.19 **Policy LP13: Town centre uses** outlines the need for a sequential test if main town centre uses are proposed to be located outside of the defined boundaries. Proposals which fail to pass the sequential test will not be supported.

Educational Development

- 6.20 **Policy LP4: Providing infrastructure** states that the council will work with partners to bring forward the infrastructure that is required in order to deliver the spatial strategy as set out in the KLP19. Additionally it states that new development should contribute to the provision of infrastructure, taking account of local and strategic needs and financial viability. This may be achieved through planning conditions and/or through contributions to the Community Infrastructure Levy (CIL).
- 6.21 **Policy LP49: Educational and health care needs** outlines that where the scale of development proposed may impact on education and health provision, the council will actively work with applicants to resolve key planning issues in advance of a planning application being submitted. Proposals for new or enhanced educational facilities will be permitted where they meet an identified deficiency in provision; the scale, range, quality and accessibility of education facilities are improved; and, they are well related to the catchment they are intended to serve to minimise the need to travel or they can be made accessible by walking, cycling and public transport.

Open Space and Social Infrastructure

- 6.22 **Policy LP63: New open space** states that the Council will seek to secure well-designed new and improved open space, sport and recreation facilities to encourage everyone in Kirklees to be as physically active as possible and promote a healthy lifestyle.
- 6.23 **Policy LP47: Healthy, active and safe lifestyles** states that the Council will, with its partners, create an environment which supports healthy, active and safe communities and reduced inequality. This will be enabled in a number of ways including increasing access to green spaces, encouraging more sustainable travel choices and encouraging initiatives to promote energy efficient homes.

Assessment Scope, Study Area, and Data Sourcing

Assessment Scope and Consultation

- 6.24 The Site covers an area of approximately 112 ha and comprises a mixture of arable and pastoral agricultural land. The Site has not been previously developed.
- 6.25 The Site is included within an allocation for mixed use development in the Kirklees Local Plan (adopted February 2019) (KLP19) (site reference MXS7).
- 6.26 The majority of socio-economic effects resulting from the Proposed Development are expected to occur within the local area (Dewsbury East ward and Batley East ward), with some effects potentially affecting the local government district of Kirklees, and the wider Yorkshire and the Humber Region.
- 6.27 The following topics have been considered when identifying the likely significant socio-economic effects of the Proposed Development on socio-economic factors:
- Local Population: changes in the local population;
 - Housing: changes in supply and requirements;
 - Expenditure: changes in local retail and leisure spending;
 - Employment: changes in employment opportunities;
 - Primary healthcare: changes in demand for dental and GP facilities;
 - Education: changes in demand for education and infrastructure to support student education;
 - Open space, recreation and amenity: changes in supply of, and demand for, open space for public recreation and amenity; and,
 - Crime: changes in the occurrence of, and opportunities for, criminal activity.
- 6.28 Further detail on the scope of this socio-economic assessment is summarised below, whilst the assessment is set out in the next section.

Scoping Process

- 6.29 As discussed in Chapter 2 of this ES, socio-economic impacts have been scoped into the EIA in order to provide a robust consideration of the likely socio-economic effects of the Proposed Development.
- 6.30 A formal EIA scoping request was submitted to KMDC on 27 September 2018. To inform this, a scoping exercise was undertaken by the project team to identify the topics which are pertinent to this assessment, and the assessment scope is therefore based upon experience of similar projects and upon professional judgement.

Topics Scoped Out

- 6.31 The assessment of effects on local population, housing, primary healthcare, education, and open space, recreation and amenity during the construction phase has been scoped out as workers are not likely to be housed either on-site or nearby, and will not result in a permanent addition to the local population. Construction workers may use local parks and hospital facilities during the construction phase, but this would be minor and temporary and therefore would not be likely to represent a significant environmental effect. Effects on crime during construction are also not expected to be significant, due to the provision of appropriate security measures and lighting, so have been scoped out.
- 6.32 Effects on population in terms of health and wellbeing will be given consideration in Chapter 16 which is a standalone assessment of Type 1 cumulative effects. Chapter 15 will

draw upon the likely residual effects identified within the assessments and is considered as a standalone chapter within the Environmental Statement.

6.33 The socio-economic assessment's scope is summarised in Table 6.1 below.

Table 6.1: Assessment Scope

Topic	Construction Phase	Operational Phase
Local Population	x	✓
Housing	x	✓
Expenditure	✓	✓
Employment	✓	✓
Healthcare Facilities	x	✓
Education	x	✓
Open space, recreation and amenity	x	✓
Crime	x	✓

Study Area

- 6.34 The study areas within this assessment are, broadly, the 'Site', 'local-sub-regional' and 'regional' scales. These scales are used as a guide within the assessment. As set out in the methodology section of this chapter, different study areas are used for different assessments where considered to be appropriate, and the study area for each individual assessment is based upon experience of similar projects and professional judgement.
- 6.35 The study areas for both defining the baseline conditions and for undertaking the assessments are influenced by the availability of data, as discussed further in the limitations section below. The study areas draw upon the publicly available data at various spatial scales for Dewsbury East ward and Batley East ward, KMDC's administrative area, Yorkshire and the Humber, and England. This data is then used during the assessment to draw conclusions in relation to the relevant study areas. Where other data is used outside of these spatial scales, this is clearly stated within the chapter.
- 6.36 In the context of the above, the study area for this assessment is broadly defined on two levels:
- Likely significant effects on the Site and local surrounds, representing ward-level (Dewsbury East ward and Batley East ward) and local government district scales (KMDC);
 - Likely significant effects on the wider regional scale, representing the Yorkshire and the Humber scale.
- 6.37 Notwithstanding the above, where appropriate for relevant assessment topics, wider or bespoke study areas around the Site have been determined with reference to the appropriateness for individual assessments (for example, radii based on distances are used within the assessments of healthcare facilities). In such cases, the reference scale is clearly stated within the assessment, for the avoidance of ambiguity.

- 6.38 In defining the study areas, consideration has been given to advice set out by English Partnerships in established guidance².

Data Sourcing

- 6.39 Data has been gathered from a range of recognised sources. Where available, the most recent and relevant data has been sought. Data sources within the chapter are referenced, including footnotes where appropriate.
- 6.40 Baseline data was gathered by Deloitte Real Estate in Winter 2019, unless otherwise stated. Data sources used in this assessment include:
- Office for National Statistics (ONS)³;
 - NHS Choices⁴;
 - Local Authority;
 - The Applicant; and
 - Maps and plans.

Assessment Methodology

Housing

- 6.41 Operational phase effects on local housing provision have been assessed quantitatively, calculated using ONS data on average household sizes, and assessed in the context of relevant policy and housing targets.

Employment

Construction Phase

- 6.42 Construction phase job creation has been calculated with reference to an assumed average construction worker output based upon ONS data⁵. The estimated construction cost has been divided by the average output per worker to give an estimate of 'person years' of employment. This is then divided by the estimated construction phase timescale in years, to give an estimate of average annual direct employment (FTE) at the Site during the construction phase. Indirect employment, as discussed below, is then calculated using multipliers.
- 6.43 The study area for employment covers the KMDC and East Midland areas; these scales are considered suitable for assessing local/sub-regional effects of new physical development in urban areas, and are in line with advice set out by the Homes and Communities Agency (HCA) within the Employment Densities Guide⁶. These scales also represent that the employment opportunities associated with both construction and operation are likely to be taken up by people either within the local area, or within the wider regional area. This has not been considered at a ward level as it is anticipated that the effect on employment at this level will be minimal.

² English Partnerships (2014), Additionality Guide – A Standard Approach to Assessing the Additional Impacts of Interventions (Fourth Edition), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/378177/additionality_guide_2014_full.pdf

³ <http://www.ons.gov.uk/ons/index.html>

⁴ <https://www.nhs.uk/service-search/>

⁵ The ONS Annual Business Survey data indicates that the average ratio of expenditure to jobs in the construction industry was £181,818 in 2016.

⁶ Employment Densities Guide, 3rd Ed. (2015). OffPAT and HCA.

- 6.44 The total number of direct and indirect jobs that are likely to be created during construction has been assessed. 'Net additional' jobs are considered within the assessment, to identify the overall change in employment at the Site.
- 6.45 Direct employment comprises temporary employment associated with the construction phase of the Proposed Development.
- 6.46 Indirect employment comprises:
- That arising off-site in response to the demand generated by the construction of the Proposed Development, in relation to construction materials and supplies;
 - Jobs arising off-site through the increased demand for goods and services by the future occupiers of the Proposed Development; and
 - Jobs resulting from employees' expenditure from the construction phase on local goods and services.
- 6.47 Indirect employment is not assessed, however is accounted for through the consideration of 'additionality factors' in relation to direct employment.
- 6.48 Additional factors have been accounted for with reference to the established HCA Employment Densities Guide. Gross additional direct employment is expected to be subject to some 'leakage', 'displacement' and 'composite multiplier effects'. In this instance, these additionality factors are likely to be:
- Leakage⁷ - jobs taken by people outside the study area;
 - Displacement⁸ - employment lost, moved or adversely affected by the employment created by the Proposed Development; and
 - Composite Multiplier Effects⁹ - additional economic benefit derived from income earned by the new employment, and as an indirect result of supply chain linkages.
- 6.49 Construction phase employment at the Site is expected to vary across the construction phase, however for the purposes of this assessment, an average number of jobs across the construction phase has been assumed.
- 6.50 It is considered likely that the majority of construction jobs would go to those residing permanently within the Yorkshire and the Humber area and therefore a 'medium' leakage rate of 25% has been assumed to reflect this.
- 6.51 Displacement effects are not considered to be significant in the context of the Proposed Development's construction, and as such displacement effects are assumed to be negligible.
- 6.52 The composite multiplier for the construction phase is 1.5 (ie 50%), based upon the English Partnerships Guide setting out average composite multiplier effects at the regional scale. Based on professional judgement this is considered appropriate, as the majority of construction related employment impacts are expected to affect the Yorkshire and the Humber region.

⁷ 'Leakage' is defined in the English Partnerships Guidance (2014) (pg. 22) as 'the proportion of outputs that benefit those outside the intervention's target area or group'.

⁸ 'Displacement' is defined in the English Partnerships Guidance (2014) (pg. 28) as 'the proportion of intervention outputs/outcomes elsewhere in the target area'.

⁹ The composite multiplier has been derived based upon interpretation of the English Partnerships Guidance (2014). 'Multiplier effects' are expected where initial direct spending gives rise to further economic effects, which demonstrates that an initial investment can have greater indirect benefits as this spending is diffused through the economy.

Operational Phase

- 6.53 Operational phase employment has been estimated using the Employment Densities Guide 3rd edition and floorspace figures provided by the Applicant.
- 6.54 The indicative total number of direct and indirect jobs that are likely to be created during the operational phase has been assessed. 'Net additional' jobs are considered within the assessment.
- 6.55 Additional factors have been accounted for with reference to the established HCA Employment Densities Guide. Gross additional direct employment is expected to be subject to some 'leakage', 'displacement' and 'composite multiplier effects'. In this instance, these additionality factors are likely to be:
- Leakage - jobs taken by people outside the study area;
 - Displacement - employment lost, moved or adversely affected by the employment created by the Proposed Development; and
 - Composite Multiplier Effects - additional economic benefit derived from income earned by the new employment, and as an indirect result of supply chain linkages.
- 6.56 It is considered likely that the majority of operational jobs would go to those residing permanently within the KMDC area and therefore a 'medium' leakage rate of 25% has been assumed to reflect this.

Local Expenditure

Construction Phase

- 6.57 Construction phase effects on local expenditure resulting from employment at the Site during construction have been assessed quantitatively, by applying an expenditure assumption to the number of jobs it is projected the Proposed Development would generate.
- 6.58 Construction phase local expenditure is calculated by multiplying the average spent per worker per day on lunch, by the calculated number of employees and by a 233 day working year (which assumes working weekdays only, and the statutory 4 weeks holiday). The average lunchtime spend figure (£3.69) is based on research commissioned by Visa¹⁰ in 2014, at the time of writing there is not a more recent figure available.
- 6.59 A leakage assumption has been applied to the lunchtime spending figure, in order to account for those who spend money on lunch outside of the local area; a 'high' (25%) leakage assumption is deemed appropriate in the context of the Site's location and characteristics being located near to the strategic road network and with workers likely to travel in from further afield.
- 6.60 The result of this calculation, following leakage, gives an estimation of spending by construction workers which would be experienced within the local area. A composite multiplier is also applied, in line with the English Partnerships guidance as previously discussed, which gives an approximation of the wider effects of construction-phase spending on the local/sub-regional area.
- 6.61 The overall effect is then determined qualitatively by using professional judgement.

¹⁰ Results are based on an online survey carried out by research agency Loudhouse. 2,155 UK commuters (aged 18 or over) who work full or part time and travel to work at least once a week were surveyed during April 2014, available at: <https://www.visaeurope.com/media/pdf/17590.pdf>

Operational Phase

- 6.62 Operational phase effects of the Proposed Development's future occupiers on local expenditure have been assessed qualitatively, with reference to expenditure data from the most recent ONS Family Spending Survey (2018).
- 6.63 Local expenditure for the employees of the proposed development is calculated by multiplying the average spent per worker per day on lunch, by the calculated number of employees and by a 233 day working year (which assumes working weekdays only, and the statutory 4 weeks holiday). The average lunchtime spend figure (£3.69) is based on research commissioned by Visa in 2014, at the time of writing there is not a more recent figure available.
- 6.64 The overall effect is then determined qualitatively by using professional judgement.

Healthcare Facilities

- 6.65 For the purposes of this assessment, healthcare facilities are considered to comprise General Practitioner (GP) and dentist surgeries within a 3 mile radius of the Proposed Development that accept NHS patients. The 3 mile radius is based upon a reasonable travel distance and professional experience.
- 6.66 Construction workers are not expected to be housed either on-site or nearby, as discussed above in the Assessment Scope section. Therefore, construction phase effects on healthcare facilities have been scoped out of further assessment. In the event of accidents on-site, the contractor's health and safety protocol would identify the nearest hospital.
- 6.67 The Proposed Development includes residential development comprising up to 1,354 dwellings and up to 35ha employment land including a small flexible commercial space, therefore the Proposed Development will increase the local population and demand for healthcare facilities in the local area in comparison to the baseline situation. In order to calculate likely effects, the forecast population has been analysed qualitatively against the assumed capacity of healthcare facilities identified using publicly available information.
- 6.68 From professional experience of similar projects, detailed capacity data for GP and dentist surgeries is not held by NHS England.
- 6.69 For GP and dentist surgeries, relevant surgeries have been identified from NHS Choices. Professional judgement has then been applied to assess significance, which is considered appropriate in the absence of detailed capacity data. Significance has been determined based upon the significance criteria set out below in Paragraph 6.80, and in line with the overarching EIA methodology set out in Chapter 2, by using professional judgement to consider the impact of the Proposed Development on the baseline capacity of the existing surgeries.
- 6.70 Only effects on the capacity of healthcare facilities in the form of GP practices and dental surgeries are assessed within this assessment. Effects on human health are considered within the other relevant chapters of this ES, namely Chapter 10 Air Quality and Chapter 9 Noise and Vibration. The individual technical chapters of the ES give consideration to Type 2 cumulative effects, whilst an assessment of Type 1 cumulative effects is included at the end of the ES.

Education

- 6.71 For the purpose of this assessment, education facilities are considered to comprise early years facilities (from age 3) (herein referred to as "pre-school"), primary schools and secondary schools within a 2 mile radius (primary) and 3 mile radius (secondary) of the Proposed Development. These distances are based upon a reasonable travel distance and professional experience.

- 6.72 The Primary School (including pre-school facilities) within the Proposed Development has also been reviewed to determine the availability of infrastructure.
- 6.73 The education assessment gives qualitative consideration to the impact of the Proposed Development on the availability of infrastructure which supports pre-school, primary and secondary education. The overall effect is derived based on professional judgement and in accordance with the overarching methodology, with reference being drawn to the existing baseline conditions identified in relation to local population.

Open Space, Recreation and Amenity

- 6.74 New residents and employees at the Proposed Development will require open space and space for recreational use and amenity value. Existing areas of publicly accessible open space and the amenity space and public realm proposals within the Proposed Development have been reviewed to determine the areas available for residents and visitors to use.
- 6.75 Baseline data on existing public open spaces which could be used for recreation and amenity were gathered using the countryside, parks and open spaces information on the KMDC website¹¹ and the Local Plan allocations map¹².
- 6.76 Operational phase effects on open space have been assessed qualitatively. On the basis of professional judgement, 1 mile is considered to be an accessible walking distance for open space, recreation and amenity.

Crime

- 6.77 A qualitative assessment has been completed for the likely effects on crime in the local area as a result of the Proposed Development, for the operational phase. Consideration is given to the baseline crime data taken from Police.UK statistics, as set out within the baseline section.
- 6.78 The Proposed Development's anticipated effects on the safety of the local area, the potential for criminal acts and the perception of crime have been considered. Potential effects are determined by applying professional judgement and expertise in view of the existing crime level of the area and experience of similar projects.

Significance Criteria

- 6.79 The significance of likely significant socio-economic effects has been assessed using professional judgement, with reference to established guidance where relevant, the significance criteria set out below, and the overarching EIA methodology set out in Chapter 2 of this ES.
- 6.80 The significance of socio-economic effects has broadly been determined by considering:
- The value of the resource (international, national, regional and local level importance);
 - The magnitude of the effect;
 - The duration of the effect;
 - The reversibility of the effect; and
 - The number of sensitive receptors.
- 6.81 As outlined in Chapter 2: EIA Methodology, significance is assessed as either negligible or minor for effects not considered to be significant, or moderate and major where effects are

¹¹ <https://www.n-kesteven.gov.uk/visitors-and-leisure/sports-leisure-culture-and-the-arts/countryside-and-open-spaces/>

¹² <https://www.n-kesteven.gov.uk/central-lincolnshire/policies-map-and-interactive-map/>

considered to be adverse or beneficial. Qualitative terminology specific to each potential type of effect is described below:

- Major Adverse: Considerable detrimental or negative effect on a socio-economic factor;
- Moderate Adverse: Modest local scale detrimental effect upon a socio-economic factor;
- Minor Adverse: Slight, short or highly localised changes in socio-economic factors;
- Negligible: No appreciable effect on socio-economic indicators;
- Minor Beneficial: Changes in socio-economic factors which have small beneficial effects such as minor net employment creation effects, minor local-scale improvements and on other socio-economic and community indicators;
- Moderate Beneficial: Modest beneficial changes to socio-economic factors; and
- Major Beneficial: Considerable beneficial change to socio-economic factors. Major local-scale/moderate regional scale improvement.

6.82 The likely significance of effects has been determined in a qualitative manner using professional judgement. This is on the basis of the criteria outlined above, and in Chapter 2, EIA Methodology.

Receptor Sensitivity

6.83 The criteria used to assess receptor sensitivity is described in Table 6.2.

Table 6.2: Criteria for determining receptor sensitivity

Sensitivity	Criteria
High	Receptors that will be most directly affected by any effects of the Proposed Development and receptors with significant economic or social stake in the area (e.g. nearby local residents of the Proposed Development)
Moderate	Receptors that are sensitive to effects by virtue of proximity, accessibility or the specific facilities or uses provided by the Site (e.g. local community facilities, employees, businesses)
Low	Receptors that are likely to experience some effect from the redevelopment proposals but at a low level (e.g. existing local businesses)
Negligible	Receptors with minimal connection to the Site and little likelihood of being affected by any development effects (e.g. regional population)

Magnitude of Change/Impact

6.84 The criteria used to assess how far an effect deviates from the baseline condition, i.e. the magnitude of change, are described in Table 6.3.

Table 6.3: Criteria for determining magnitude of change/impact

Magnitude	Criteria
High	Effects that would have a significant economic or social effect locally or would be felt more widely than the regional/ local scale. These effects are likely to directly affect a large number of receptors or those with high sensitivity.
Moderate	Effects that have a material economic or social effect locally or would be felt at a city scale.

Low	Effects that have some economic or social effect at a localised level.
Negligible	Effects that have minimal economic or social effects.

Significance Evaluation

- 6.85 This assessment uses the scale of significance described in Chapter 2 to assess the potential and residual effects of the Proposed Development against the baseline conditions. The assessment process aims to be objective and quantifies the effects as far as possible. However, some effects can only be evaluated on a qualitative basis.
- 6.86 The significance of a potential effect is derived by considering both the sensitivity of the feature and the magnitude of change, as demonstrated in Table 6.4.

Table 6.4: Matrix for Determining Effect Significance

		Magnitude of Change / Impact				
		Description	High	Medium	Low	Negligible
Receptor Sensitivity	High	Major	Major	Moderate/Minor	Negligible	
	Moderate	Major	Moderate	Minor	Negligible	
	Low	Moderate/Minor	Minor	Minor	Negligible	
	Negligible	Negligible	Negligible	Negligible	Negligible	

- 6.87 Effects can also be described, for example, as:
- Beneficial or adverse;
 - Permanent or reversible;
 - Short, medium or long term; and
 - Significant (major or substantial) or insignificant (indiscernible or minor).
- 6.88 The overall EIA methodology is set out in detail in Chapter 2 of this ES. In general, temporary, short to medium-term significant effects are considered to be those associated with the construction works. Long-term effects are those associated with the Proposed Development once complete and operational.
- 6.89 Where moderate and major effects are identified, these are considered to be 'significant'. Where an effect is assessed as being within the 'Moderate/Minor' category professional judgment has been used to determine if it is considered a significant effect or not.

Limitations and Assumptions

- 6.90 The assessment of the significance of effects has been carried out against a benchmark of current socio-economic baseline conditions surrounding the Site. As with any dataset, these may be subject to change over time, which may influence the findings of the assessment and could lead to the assessment suffering from statistical time lag. Based on the availability of data there are also limitations with regards to the presentation of directly comparable data at similar spatial scales.
- 6.91 The Employment Densities Guide 3rd Edition (HCA, 2015) has been used as the basis for calculating the number of employees in the operational phase. Uses described in the Guide that align closely with the Proposed Development have been used for the purposes of employment calculations. Depending upon how the facilities are operated in the future, there may be variations in the Full Time Equivalent (FTE) employment.

- 6.92 Assumptions and limitations of the assessment are discussed throughout this ES chapter, where relevant, and are summarised below:
- Baseline conditions have been established using available published data/ statistics at the time of writing (Autumn 2019);
 - The availability of data at pre-determined spatial scales has, to an extent, determined the study areas and the areas against which comparisons are drawn within the assessments;
 - Estimated construction costs have been provided by Savills, and will be subject to change during the Reserved Matters and detailed design process. The estimated figure has not been provided within this Statement as it is commercially sensitive but can be shared upon request;
 - Multipliers have been used where appropriate, to quantify effects;
 - Where applicable, data searches have been performed using the nearest postcode to the Site (WF12 7QY);
 - Some assessments have drawn upon 2011 Census figures, which do not necessarily demonstrate the contemporary characteristics of the area;
 - The expenditure assessment assumes all workers will spend an average amount per day on lunch; and,
 - Due to inherent difficulties in assessing the significance of socio-economic effects, and lack of formal guidance, it is inevitable that there will be a degree of subjectivity within the assessment.

Baseline Conditions

- 6.93 This section sets out the current socio-economic conditions within and around the Site. The purpose of this is to establish the context for the Proposed Development against which the effects can be identified.
- 6.94 Baseline conditions at the site scale and local/sub-regional scale have been gathered with regard to the following socio-economic factors:
- Local Population;
 - Housing;
 - Employment;
 - Local Expenditure;
 - Healthcare Facilities;
 - Education;
 - Open Space, Recreation and Amenity; and
 - Crime.

Local Population

- 6.95 No people currently reside at the Site.
- 6.96 The mid-2018 ONS Population estimates that in total, Dewsbury East ward and Batley East ward had a population of 39,249, comprising 49.5% females and 50.5% males. At a district scale, the population of KMDC was 438,727, comprising 50.4% females and 49.6% males. The Yorkshire and the Humber region population totalled 5,479,615, comprising 50.6% females and 49.4% males. England as a whole comprised a population of 50.6% females and 49.4% males.

- 6.97 Table 6.5 demonstrates the population of Dewsbury East ward and Batley East ward, broken into age groups:

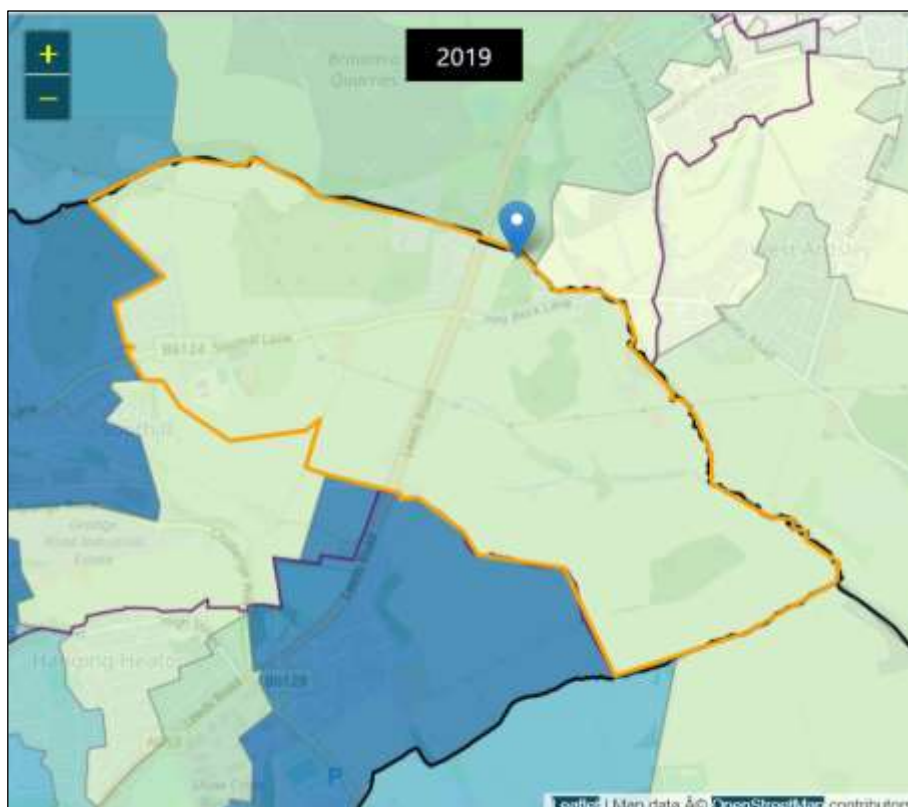
Table 6.5: Age Groups within Dewsbury East ward and Batley East ward and KMDC (data sourced from ONS)

Ages	KMDC	Wards total	Batley East	Dewsbury East
0 to 2	16,142	1,635	882	753
3 to 4	11,304	1,090	555	535
5 to 11	40,799	3,850	2,089	1,761
12 to 18	37,090	3,616	2,016	1,600
19 to 24	32,515	2,810	1,473	1,337
25 to 34	56,131	5,751	2,896	2,855
35 to 44	55,034	5,301	2,761	2,540
45 to 54	61,652	5,264	2,499	2,765
55 to 64	51,212	4,185	1,883	2,302
65 to 74	43,219	3,165	1,391	1,774
75 to 84	24,385	1,859	845	1,014
85+	9,244	723	296	427
TOTAL	438,727	39,249	19,586	19,663

- 6.98 In Dewsbury East ward and Batley East ward, the age group which comprised the greatest proportion of the population is 25 to 34 year olds (14.65%) and the smallest age group is 85+ year olds (1.84%). In KMDC, the age group which comprised the greatest proportion of the population is 45 to 54 year olds (14.05%) and the smallest age group is 85+ year olds (2.77%). Therefore Dewsbury East ward and Batley East ward show similar trends in age demographic, albeit with a larger proportion of 25 to 34 year olds.
- 6.99 In the Yorkshire and the Humber, the age group which comprises the greatest proportion of the population is 45 to 54 year olds (13.69%) and the smallest age group is 85+ year olds (2.35%). In England (2018 population estimated at 55,977,178) the age group which comprises the greatest population is 45 to 54 year olds (13.78%) and the smallest age group is 85+ year olds (2.44%).

Deprivation

- 6.100 Deprivation at the local level is measured by the Index of Multiple Deprivation (IMD), which uses a series of data to rank areas across seven domains that vary and range from income to health. These categories are then combined in order to produce a 'multiple deprivation score' for each local area.



Map showing Index of Multiple Deprivation 2019¹³

6.101 The Site is located within the Kirklees 007A lower super output area (LSOA), as shown by the map above.

Table 6.6: Deprivation Levels within LSOA Kirklees 007A (data sourced from DCLG's Indices of Multiple Deprivation Explorer)

	Index of Multiple Deprivation	Income Deprivation	Employment Deprivation	Education, Skills and Training
LSOA Kirklees 007A	20,042 out of 32,844 LSOAs in England*	18,059 out of 32,844 LSOAs in England*	20,103 out of 32,844 LSOAs in England*	14,673 out of 32,844 LSOAs in England*

*where 1 is the most deprived

6.102 There are 259 LSOAs in the KMDC local authority district. Using the Indices of Multiple Deprivation rank of average summary measure, this authority ranked 87 in 2019, out of 317 local authorities.

Housing

6.103 There are no existing residential units within the Site.

6.104 The 2011 Census shows that, in Dewsbury East ward and Batley East ward, the greatest proportion of households were owned, either outright or through a loan or mortgage; this is similar to KMDC, the Yorkshire and the Humber and England, where the majority of houses are also owned.

6.105 Dewsbury East and Batley East are characterised by higher levels of social rented households in comparison with KMDC, Yorkshire and Humber and England.

¹³ IOD2019 Explorer http://dcigapps.communities.gov.uk/imd/iod_index.html

6.106 Table 6.7¹⁴ below shows tenure distribution across the study areas from the 2011 Census.

Table 6.7: Existing Tenure Distribution

Variable	Count	Dewsbury East	Batley East	Wards Total	KMDC	Yorkshire Humber
All Households (Households)	Count	7,930	6,820	14,750	173,525	2,224,059
Owned; Total (Households)	Count	4,860	4,130	8,990	116,361	1,425,563
	Percentage	61.29%	60.56%	60.95%	67.06%	64.1%
Shared Ownership (Part Owned and Part Rented) (Households)	Count	54	29	83	612	9,637
	Percentage	0.68%	0.43%	0.56%	0.35%	0.43%
Social Rented (Households)	Count	1,693	1,351	3,044	26,525	402,653
	Percentage	21.35%	19.81%	20.64%	15.29%	18.1%
Private Rented (Households)	Count	1,178	1,163	2,341	26,941	353,448
	Percentage	14.85%	17.05%	15.87%	15.53%	15.89%
Living rent free	Count	145	147	292	3,086	32,758
	Percentage	1.83%	2.16%	1.98%	1.78%	1.47%

Note: numbers may not add due to rounding

Employment

6.107 Based on the 2011 Census, the top five employing industries in the Dewsbury East and Batley East Wards, as compared with KMDC, the Yorkshire and the Humber and England are shown in Table 6.8¹⁵ below.

Table 6.8: Top Five Employing Industries

Industry of Employment	Dewsbury East	Batley East	Wards Total	KMDC	Yorkshire and the Humber	England
Wholesale and retail trade; repair of motor vehicles and motor cycles	18.84%	23.24%	20.86%	17.46%	16.87%	15.93%
Manufacturing	16.35%	19.14%	17.63%	15.03%	11.23%	8.85%
Human health and social work activities	11.68%	9.18%	10.53%	12.25%	13.35%	12.4%
Education	7.76%	9.41%	8.52%	10.57%	10.1%	9.9%
Construction	8.65%	5.54%	7.22%	7.7%	7.98%	7.68%

6.108 Within the Dewsbury East and Batley East wards, the largest sector of employment is wholesale and retail trade; repair of motor vehicles and motor cycles. The wards total comprises a higher proportion than those employed across KMDC, the Yorkshire and the Humber and England. The data indicates that the largest employers in Dewsbury East and Batley East are different to those at regional and national levels.

¹⁴ Source : 2011 Census, ONS

¹⁵ Source: 2011 Census, ONS

6.109 Manufacturing employs the second largest proportion of people over both wards and this again reflects a higher proportion than those employed across KMDC, the Yorkshire and the Humber and England.

6.110 Table 6.9 below shows economic activity data from the 2011 Census.

Table 6.9: Economic Activity

Variable	Count	Dewsbury East	Batley East	Wards Total	KMDC	Yorkshire and the Humber	England
All Usual Residents aged 16-74 (Persons)	Count	13,716	13,398	27,114	307,194	3,875,219	38,881,374
Economically active: Employees Part-time (Persons)	Count	2,072	2,205	4,277	44,638	564,578	5,333,268
	Percentage	15.11%	16.46%	15.77%	14.53%	14.57%	13.72%
Economically active: Employees Full-time (Persons)	Count	5,291	3,815	9,106	112,199	1,435,376	15,016,564
	Percentage	38.58%	28.47%	33.59%	36.52%	37.04%	38.62%
Economically active: Self-employed (Persons)	Count	1,029	1,040	2,069	27,494	325,432	3,793,632
	Percentage	7.5%	7.76%	7.63%	8.95%	8.4%	9.76%
Economically active: Unemployed (Persons)	Count	781	811	1,592	14,465	187,755	1,702,847
	Percentage	5.69%	6.05%	5.87%	4.71%	4.85%	4.38%
Economically active: Full-time student (Persons)	Count	362	372	734	10,718	136,834	1,336,823
	Percentage	2.64%	2.78%	2.71%	3.49%	3.53%	3.44%

Source: 2011 Census, ONS

6.111 The full-time employment rate in the Batley East ward (28.47%) is notably lower than Dewsbury East (38.5%), KMDC (36.52%), the region (37.04%) and national averages (38.62%).

6.112 A lower number of people are self-employed in the Dewsbury East and Batley East Wards (combined average of 7.63%) than in KMDC (8.95%), the Yorkshire and the Humber (8.4%) and England (9.76%).

6.113 Unemployment in the Dewsbury East and Batley East Wards (5.87%) is significantly higher than in KMDC (4.71%) and Yorkshire and the Humber (4.85%) and the English average (4.38%).

Local Expenditure

6.114 The ONS Family Spending Survey (2018) calculated the average total weekly expenditure per household in England as £565.10. The average weekly expenditure per household in the Yorkshire and the Humber is lower than the English average at £520.90.

6.115 The 2011 Census states that there are 14,750 households in Dewsbury East and Batley East. Using the average Yorkshire and the Humber spend from the ONS Family Spending Survey (2018) it can be assumed that the total local expenditure across both wards is approximately £7,683,275.

Healthcare Facilities

6.116 Data on GP surgeries and dental practices have been gathered from the NHS Choices website, using a search radius of 3 miles.

6.117 Table 6.10 sets out local GP surgeries identified and identifies whether they are accepting new adult and child NHS patients¹⁶.

Table 6.10: Local GP Surgeries

Surgery	Distance from Site	Accepting New NHS Adult and Child Patients
Grove House Surgery, Soothill Lane, Batley. WF17 5SS	1.5 miles	✓
Leigh View Medical Practice, Bradford Road, Tingley. WF3 1RQ	1.6 miles	✓
Wellington House Surgery, 4 Henrietta Street, Batley. WF17 5DN	1.8 miles	✓
South Queen Street Medical Centre, South Queen Street, Morley. LS27 9EW	1.9 miles	✓
Broughton House GP Practice, 20 New Way, Batley. WF17 5QT	1.9 miles	✓
Batley Health Centre Surgery, 130 Upper Commercial Street, Batley. WF17 5ED	1.9 miles	✓
Cherry Tree Surgery, 132 Upper Commercial Street, Batley. WF17 5DH	1.9 miles	✓
Earlsheaton Medical Centre, 252 Wakefield Road, Earlsheaton. WF12 8AH	2.0 miles	✓
The Fountain Medical Centre, Little Fountain Street, Leeds. LS27 9EN.	2.0 miles	✓
Windsor Medical Centre, 2 William Street, Dewsbury. WF12 7BD	2.0 miles	✓
Mount Pleasant Medical Centre, 69 Purlwell Lane, Batley. WF17 7PF	2.0 miles	✓
Morley Health Centre Surgery, Corporation Street, Leeds. LS27 9NB	2.1 miles	✓
Windsor House Surgery, 2 Corporation Street, Morley. LS27 9NB	2.1 miles	✓

¹⁶ Source: NHS Choices

Surgery	Distance from Site	Accepting New NHS Adult and Child Patients
Chickenley Medical Centre, 1 Walnut Lane, Dewsbury. WF12 8NJ	2.2 miles	✓
The Albion Mount Medical Practice, 47 Albion Street, Dewsbury. WF13 2AJ	2.3 miles	✓
Church Street Surgery, Ossett Health Village, Kingsway. WF5 8DF	2.4 miles	✓
Prospect Surgery, Ossett Health Village, Kingsway. WF5 8DF	2.4 miles	✓
Eightlands Surgery, Wellington Road, Dewsbury. WF14 1HN	2.6 miles	✓
Calder View Surgery, Wellington Road, Dewsbury. WF13 1HN	2.6 miles	✓
Middleton Park GP Surgery, Middleton Park Avenue, Leeds. LS10 4HT	2.6 miles	✓
Savile Town Medical Centre, 786 Scarborough Street, Dewsbury. WF12 9AY	2.8 miles	✓
Healds Road Surgery, Dewsbury. WF13 4HT	2.8 miles	✓
Brewery Lane Surgery, 37 Warren Street, Dewsbury. Wf12 9LX	2.8 miles	✓
Savile Road Surgery, 90 Savile Road, Dewsbury. WF12 9LP	2.8 miles	✓
Shenstone House Surgery, Elland Road, Churwell. LS27 7PX	3.0 miles	✓

6.118 There are 25 GP surgeries within 3 miles of the Site which are all currently accepting new NHS patients.

6.119 The NHS Choices website illustrates even more GPs outside the 3 mile radius are also accepting new NHS patients.

6.120 Table 6.11¹⁷ shows local dentist surgeries identified, and whether they are accepting new adult and child NHS patients.

¹⁷ Source: NHS Choices

Table 6.11: Local Dentist Surgeries

Dentist Surgeries	Distance from Site	Accepting New NHS Adult and Child Patients
Hick Lane Dental Surgery, 17 Hick Lane, Batley. WF17 5TD	1.6 miles	No
The Dental Studio, 120 Bradford Road, East Ardsley. WF3 2JL	1.8 miles	No data supplied by the dental practice
Eclipse Dental Care, 27 Branch Road, Batley. WF17 5SB	1.8 miles	No
Genix Healthcare Morley, 13 Watson Street, Morley. LS27 0AH	1.8 miles	No data supplied by the dental practice
Locala CIC Dental Care, Batley Health Centre, 130 Upper Commercial Street. WF17 5ED	1.9 miles	Yes, only by referral from a dental practitioner
Fountain Dental Practice, Little Fountain Street, Morley. LS27 9EN	2.0 miles	No
Mount Dental Surgery, 67a Purlwell Lane, Batley. WF17 7QF	2.0 miles	Yes, only by referral from a dental practitioner
Batley Carr Dental, 41 Town Street, Dewsbury. WF13 2HQ	2.1 miles	Yes, only by referral from a dental practitioner
Mydentist, 3a Windsor Court, Morley. LS27 9BG	2.1 miles	No
Mydentist, Corporation Street, Morley. LS27 9NB	2.1 miles	No
Empire House Dental Surgery, Wakefield Old Road, Dewsbury. WF12 8DJ	2.2 miles	No
Dewsbury Dental Centre, 15 Halifax Road. WF13 2JH	2.3 miles	Yes, only by referral from a dental practitioner
Church Street Dental Surgery, 10 Church Street, Dewsbury. WF13 1LB	2.4 miles	No
Wesley Street Dental Practice, Consort House, Wesley Street, Ossett. WF 8ET	2.5 miles	No data supplied by the dental practice
Mydentist, 46 Bank Street, Ossett. WF5 8NW	2.6 miles	No
Wesley Dental Care, 68 Bank Street, Ossett. WF5 8NW	2.6 miles	No data supplied by the dental practice

Dentist Surgeries	Distance from Site	Accepting New NHS Adult and Child Patients
Dewsbury Dental Care, 43 Savile Road, Dewsbury. WF12 9PJ	2.7 miles	No data supplied by the dental practice
Wrenthorpe Dental Care, Wakefield. WF2 0NL	2.9 miles	Yes, only urgent dental appointments. Other data has not been supplied by the dental practice
Junction Dental Practice, 169-171 High Street, Heckmondwike. WF16 0DY	3.0 miles	No

6.151 Of the 19 dentist surgeries within 3 miles of the Site, 5 are accepting new patients. Additionally there are 5 dental practices that have not supplied any data and therefore they could be accepting new patients.

6.152 Additionally, the NHS Choices website illustrates that there are more dentists outside the 3 mile radius that are also accepting NHS patients. Registration with a dentist is not restricted by catchment.

Education

6.153 Data on education facilities has been gathered from KMDC website, Department for Education Get information about schools¹⁸, and Ofsted, accessed November 2019.

6.154 There are 17 primary schools (including infant and junior schools) within 2 miles of the Site.

Table 6.12: Local Primary Schools

Primary School Name	Distance from Site	Comments
Hill Top Primary Academy, Batley Road	0.37 miles	School capacity 210, Number of pupils 261
Westerton Primary Academy, Hesketh Lane	0.73 miles	School capacity 630, Number of pupils 708
Lydgate Junior and Infant School, Lydgate Road	0.79 miles	School capacity 322, Number of pupils 278
Shaw Cross Infant and Nursery School, Leeds Road	0.99 miles	School capacity 189, Number of pupils 243
Hanging Heaton Church of England Junior and Infant School, High Street	1.11 miles	School capacity 140, Number of pupils 134
Blackgates Primary Academy, Smithy Lane	1.35 miles	School capacity 445, Number of pupils 419
Gawthorpe Community Academy, High Street	1.49 miles	School capacity 236, Number of pupils 246
Bywell Church of England Junior School, Bendigo Road	1.51 miles	School capacity 388, Number of pupils 379
Mill Lane Primary School, Mill Lane	1.55 miles	School capacity 198, Number of pupils 190
Park Road Junior Infant and Nursery School, Park Road	1.64 miles	School capacity 210, Number of pupils 223
Field Lane Junior Infant and Nursery School, Albion Street	1.71 miles	School capacity 210, Number of pupils 239
Fountain Primary School, Fountain Street	1.8 miles	School capacity 458, Number of pupils 442
Outwood Primary Academy Kirkhamgate, Brandy Carr Road	1.89 miles	School capacity 195, Number of pupils 192

¹⁸ <https://www.get-information-schools.service.gov.uk/Establishments/Search?tok=zfA1aLgv>

Primary School Name	Distance from Site	Comments
Orchard Primary Academy, Princess Road	1.91 miles	School capacity 350, Number of pupils 308
Warwick Road Primary School, Warwick Road	1.92 miles	School capacity 340, Number of pupils 380
Batley Parish Church of England Junior Infant and Nursery School, Stocks Lane	1.94 miles	School capacity 210, Number of pupils 245
Hyrtmount Junior School, Highcliffe Road	1.96 miles	School capacity 360, Number of pupils 344

6.155 There are 9 secondary schools within 3 miles of the Site.

Table 6.13: Local Secondary Schools

Secondary School Name	Distance from Site	Comments
Woodkirk Academy, Rein Road	0.99 miles	School capacity 1785, Number of pupils 1856
Manor Croft Academy, Old Bank Road	1.84 miles	School capacity 900, Number of pupils 730
Upper Batley High School, Blenheim Drive	1.89 miles	School capacity 879, Number of pupils 673
The Morley Academy, Fountain Street	1.96 miles	School capacity 1555, Number of pupils 1542
Batley Grammar School, Carlinghow Hill	2.13 miles	School capacity 950, Number of pupils 892
Bruntcliffe Academy, Bruntcliffe Lane	2.41 miles	School capacity 1520, Number of pupils 683
Batley Girls High School, Windmill Lane	2.56 miles	School capacity 1325, Number of pupils 1229
St John Fisher Catholic Academy, Oxford Road	2.68 miles	School capacity 1069, Number of pupils 1154
Westborough High School, Stockhill Street	2.84 miles	School capacity 900, Number of pupils 898

Open Space, Recreation and Amenity

6.156 There is an area within Chidswell allocated as 'Urban Green Space' which is considered to be within an accessible walking distance to the Site.

Figure 6.1: Local Green Spaces in Chidswell (shown in green) sourced from the Kirklees Metropolitan District Council's Interactive Map



Crime

- 6.157 The Police.UK website indicates that the Site is within the 'Batley and Spen' neighbourhood policing area, and that policing priorities for the area relate to violence and sexual offences, anti-social behaviour and public order.
- 6.158 Home Office data for 'police recorded crime' shows that, the crime rate in KMDC had roughly the same average crime rate across similar areas but a lower than average crime rate for the West Yorkshire force area.
- 6.159 Recent crime data at ward level for Dewsbury East and Batley East is not available.

Identification and Evaluation of Likely Significant Effects

Construction Phase

- 6.160 The sections below identify the likely significance of those socio-economic effects scoped in to the construction phase assessment. All construction phase socio-economic effects are short-term and temporary in nature.

Employment

- 6.161 The forecast number of construction jobs has been calculated in accordance with the methodology set out above, and based upon the estimated construction cost of the project and the projected timeline for its completion.
- 6.162 Construction phase employment at the Site is expected to vary across the construction phase, and so the estimated number of employees is considered to represent an average across the construction phase.
- 6.163 The estimated construction cost has been provided by Savills but has not been included within this Statement as it is commercially sensitive. The anticipated construction programme is approximately 10 years - 15 years. The ONS Annual Business Survey indicates that the average ratio of expenditure to jobs in the construction industry was £181,818 in 2016¹⁹.
- 6.164 Applying this ratio to the estimated construction cost, the Proposed Development would be expected to create 1507 person-years of construction employment. The Site is anticipated to be constructed over 10 - 15 years, which equates to the Proposed Development generating approximately 121 FTE construction jobs over the construction phase.
- 6.165 With reference to the 2011 Census, this would approximately represent a temporary 1.3% increase in employment within the Dewsbury East and Batley East wards, and 0.11% at the KMDC scale. It is expected that the jobs created during construction would go to a range of people, with some direct and indirect construction phase employment effects experienced at the KMDC scale. The majority of construction workers are expected to come from across the KMDC and Yorkshire and the Humber region.
- 6.166 Indirect job creation is also anticipated to arise from the Proposed Development's construction, through additional demand within the supply chain. Applying the leakage (25%), displacement (0%), and composite multipliers (50%), indirect job creation is projected to be an additional 46 FTE.
- 6.167 Total (ie, direct and indirect) job creation within the study area during the construction phase is therefore estimated as 167 FTE.
- 6.168 The existing site provides up to 10 FTE jobs. Therefore, as the Proposed Development is the direct cause of loss of a small number of existing jobs, meaning the net employment generation at the Site (111 FTE) and within the wider study area during the construction phase (36 FTE) is considered to represent a temporary **moderate beneficial** effect.

¹⁹ ONS Annual Business Survey, 2016, released May 2018.

Local Expenditure

- 6.169 Applying the Visa lunchtime expenditure assumption (£3.69) to the forecast number of construction employees expected to be directly employed (121 net additional FTE) during the c. 12.5 year construction period over an assumed 233 day working year yields a figure of £1,300,402.12. As some spending would be expected to occur outside the study area, a 'high' leakage rate (25%) has been used to reflect the Site's location. Therefore it is anticipated approximately £975,301.60 would be spent within the local area over the c. 12.5 year construction period.
- 6.170 In terms of other money spent (besides from on lunch), it is expected there would be additional expenditure on convenience and comparison goods. It is not possible to accurately quantify this spending, however on the basis of professional judgement it is expected that there would be a modest increase in expenditure locally during the construction phase.
- 6.171 It is considered that the majority of this increased expenditure would benefit businesses in the local area. Therefore, effects on local expenditure are considered to be temporary and localised in nature over the construction period, and of **moderate beneficial** significance.

Operational Phase

- 6.172 The sections below identify the likely significance of those socio-economic effects scoped in to the operational phase assessment. All operational phase socio-economic effects are considered to be permanent in nature.

Local Population

- 6.173 The Proposed Development includes up to 1,354 residential units of varying sizes. Applying the average household size in KMDC of 2.52 people per household (ONS, 2011 Census), it is estimated that the Proposed Development will have a population of 3,412 people.
- 6.174 No people currently reside at the Site, therefore the net increase in the population is projected to be 3,412. With reference to Table 14.2, this is approximately an 8% increase in the population of the Dewsbury East and Batley East wards, and a 0.7% increase in the population of KMDC based on the mid-2018 population estimates.
- 6.175 The direct effects of an increase in population could lead to associated effects, such as increased crowding, noise and nuisance. However, the Site will be designed to accommodate the increased volume of people and will provide new community facilities which have been identified as part of the Site's allocation in the Kirklees Local Plan.
- 6.176 Population growth has been accounted for by the Local Plan through consideration of and the planning for the objectively assessed need for dwellings and for jobs.
- 6.177 The additional population would increase the economic activity in Chidswell, therefore the effects on population at the Site scale are considered to be of **moderate beneficial** significance, and permanent in nature.

Housing

- 6.178 The Proposed Development will involve the net addition of up to 1,354 residential units at a medium density, and is therefore in-keeping with the planning objectives for the area.
- 6.179 The KMDC Local Plan (2019) states that the objectively assessed need is an average of 1,730 dwellings per annum. Therefore, the Proposed Development's net additional 1,354 units represents approximately 65.5% of the annual target, or 9.3% of the 5 year target, however the Proposed Development is expected to be constructed over a period extending beyond 5 years.
- 6.180 The KMDC Local Plan (2019) states that Kirklees has a growing population set to increase from 47,800 in 2013, to 475,900 in 2031. Over the same period the number of households is expected to increase by 27,300.

- 6.181 The Applicant will enter into discussions with the Local Planning Authority in respect of any affordable housing or planning obligations. Given that these discussions have not concluded, affordable housing has been excluded from this assessment.
- 6.182 The Proposed Development would have significant beneficial effects on local housing provision, providing a large number of new, high-quality residential units. It would also make a significant contribution to local housing targets. Considering the above, the effect of the Proposed Development on housing is considered to be of **major beneficial** significance at the Dewsbury East and Batley East wards and KMDC scale.

Employment

- 6.183 The Proposed Development includes 35 ha of employment land equating up to 122,500 sq. m. GEA. For the purpose of this analysis, the illustrative masterplan has assumed floor areas for each relevant use class as follows:
- B1(a) Office Use: 18,375 sq. m. (GEA);
 - B1(c) Light Industrial Use: 12,250 sq. m. (GEA);
 - B2 General Industrial Use: 30,625 sq. m. (GEA); and,
 - B8 Warehousing: 61,250 sq. m. (GEA).
- 6.184 Ultimately the split between employment land uses to be delivered is flexible and will depend on demand, provided that the B1(a) Office use cannot exceed 15% of the maximum floorspace (up to 122,500 sq. m.).
- 6.185 The Proposed Development is projected to generate 3,019 FTE jobs, based on the above employment uses and applying the average density for each use class listed in the Employment Density Guide 3rd Edition (Homes and Communities Agency 2015). In addition to this, cleaners and maintenance staff would be provided by subcontractors, however in order to provide a conservative estimate of employment such jobs have not been estimated. The additional employment represents an increase in full time employment within the Dewsbury East and Batley East wards in comparison to the baseline situation (10 FTE jobs) of the existing agricultural site.
- 6.186 Based on professional experience, the majority of workers are likely to come from the wider area, therefore the additional employment has also been measured in comparison to KMDC figures. This represents an increase in full time employment within the KMDC region in comparison to the baseline situation.
- 6.187 In addition, the Proposed Development is anticipated to accommodate 3,412 people, a majority of which are expected to be of working age. The Proposed Development therefore has the potential to support job creation in KMDC through the provision of new housing and providing an attractive area to live and work.
- 6.188 Overall, the effect on employment is assessed as **major beneficial**.

Local Expenditure

- 6.189 Local retail expenditure is anticipated to increase due to spending by the Proposed Development's future residents. Therefore, permanent beneficial effects on shoppers and surrounding retail businesses in KMDC and the local area are anticipated.
- 6.190 Using the average housing weekly expenditure derived from the ONS Family Spending Survey (2018), the Proposed Development is anticipated to spend an additional £36.7m per year.
- 6.191 The Proposed Development will generate additional Council Tax revenue for KMDC. The likely tax band is unknown at this stage but due to the quantum of development it is expected to make a significant contribution.

- 6.192 In addition, there will be a large lunch time spend by the 3,019 FTE employed at the Site. Using the daily average of £3.69 per worker, as outlined above, this would equate to £2,484,244.53 over a 223 working day year.
- 6.193 Therefore, the effect of additional expenditure during the operational phase is considered to be of **major beneficial** significance to Dewsbury East and Batley East and KMDC economies, and permanent in nature.

Healthcare Facilities

- 6.194 It has not been possible to gain specific capacity data from NHS sources for the GP and dentist surgeries. As a 'worst case scenario', it is assumed that all people moving in to the area would need to register with a GP and dentist.
- 6.195 25 GP surgeries and at least 5 dental surgeries located within the 3 mile catchment of the Site are accepting new NHS patients. Based on the Proposed Development population of 3,412 people, on average, each GP surgery would need to take 136 new patients, and each dentist 682, in order to absorb the additional population.
- 6.196 It is considered that the majority of the additional demand for GPs could be absorbed by the existing healthcare facilities. In addition, data indicates that there are other medical facilities accepting new patients outside the study area which could potentially serve the Proposed Development. The Site is located in a well-connected area, providing transport links across the local area and to local hospitals.

- 6.197 Effects are therefore assessed as of **minor adverse** significance and permanent at the local scale.

Education

- 6.198 The Proposed Development is estimated to accommodate a population of 3,412 people. Based on mid-2018 ONS data, the 0-4 age group accounts for 6.8% of the Dewsbury East and Batley East population, and the 5-11 year age group accounts for 9.8% of the population, as outlined in Table 6.5.
- 6.199 There are 17 primary schools within 2 miles of the Site. Therefore, each primary school would need to accommodate approximately 33 children, however as a primary school is proposed as part of the Proposed Development it is anticipated that the majority of new primary-school aged residents will be accommodated by the on-site school.
- 6.200 Effects on primary education is therefore assessed as **major beneficial**.
- 6.201 Based on mid-2018 ONS data, the 12-18 age group accounts for 9.2% of the population, as outlined in Table 6.5.
- 6.202 There are 9 secondary schools within 3 miles of the Site. Therefore, each secondary school would need to accommodate approximately 37 children. Discussions will be held with the local education authority in regards to capacity.
- 6.203 The overall effect on education is therefore assessed as **moderate beneficial**.

Open Space, Recreation and Amenity

- 6.204 It is anticipated that future residents of the Proposed Development would make use of open space for recreation and amenity purposes.
- 6.205 The Proposed Development will contain c. 17 ha of open space for use by future and surrounding residents comprising allotments; multi-use games areas; public open space; young people's provision; parks; amenity greenspace; and, natural/ semi-natural greenspace. This will be of high quality and is expected to facilitate a range of activities.

- 6.206 The Site is situated within an area with a large amount of open space. Open spaces within 0.5 miles of the Site are considered to be within an accessible walking distance. As discussed in Paragraph 6.157 there is currently one allocated area of Urban Green Space in close proximity to the Site.
- 6.207 It is anticipated that future residents would make use of the amenity space within the Proposed Development alongside the existing nearby open spaces identified above. The proposed provision of space for recreation and amenity is considered adequate to provide for the majority of residents' needs. Residents would also likely make use of open space outside of the Site, however the effects from this are not likely to be significant and are considered to be in-keeping with the nature of the Site and its location.
- 6.208 The proposed pedestrian and cycle network will greatly enhance accessibility to green space for existing and future residents. This will contribute to creating healthy lifestyles in the community as residents will be encouraged by the creation of new pedestrian links and publically accessible open space.
- 6.209 The open space within the Proposed Development will provide additional facilities for existing residents.
- 6.210 The overall effect is therefore considered to be **minor beneficial** and permanent at the Site scale.

Crime

- 6.211 The Proposed Development will incorporate measures to 'design out' crime. Such elements include increasing natural surveillance and active frontages around the Site, and it is expected that CCTV would also be included as part of the employment uses proposed.
- 6.212 The inclusion of appropriate lighting, and the overall addition of a new population will increase activity in the area and is expected to have a beneficial effect upon crime and reducing opportunities for crime at and around the Site.
- 6.213 Overall, the effect is assessed as **minor beneficial** and permanent at the local scale.

Mitigation Measures

- 6.214 During both the construction and operational phases, all effects have been assessed to be of between moderate adverse and major beneficial significance (ie. Not significant adverse); therefore, as no significant adverse effects are predicted, no mitigation is required.
- 6.215 Section 106 obligations will be agreed if necessary following discussion with the relevant authorities and KMDC Council.

Residual Effects

- 6.216 All residual effects are expected to be the same as those predicted in the previous section.
- 6.217 Table 6.15 in the Summary section at the end of this chapter contains a summary of the predicted construction and operational effects for the Proposed Development.

Cumulative Effects

- 6.218 The Proposed Development's potential to contribute cumulative socio-economic effects has been assessed. The cumulative effects of the Proposed Development in combination with the committed developments have been assessed qualitatively, using professional judgement and with reference to publicly available information.
- 6.219 As in the previous sections, likely-significant cumulative effects have been considered in relation to the construction and operational phases, for the following topics:

- Housing;
- Employment;
- Local Expenditure;
- Healthcare Facilities;
- Education;
- Open Space, Recreation and Amenity; and
- Crime.

Construction Phase

6.220 Construction phase effects are not expected to be significant for the majority of socio-economic criteria, and construction phase cumulative effects on employment and expenditure could be expected to be beneficial. The construction phase cumulative assessment therefore considers effects on employment and expenditure, where significant effects are likely to occur.

6.221 Where the construction phases of development overlap, cumulative socio-economic effects would be more likely.

6.222 Job creation from the identified cumulative developments, in combination with the Proposed Development's 121 FTE construction phase jobs, is considered to represent a moderate benefit to employment and expenditure within the local and regional areas. More construction jobs would be available, while local businesses would benefit from construction employees spending money in the area. There are two committed developments in relatively close proximity to the Site; though some of these schemes form part of the assessment baseline it is expected that the construction phases of some of the cumulative are likely to overlap as the developments are not yet complete. It is considered that the combined effect of such overlaps on local employment and expenditure as a result of this would be **moderate beneficial** and temporary.

Operational Phase

6.223 The Proposed Development, in combination with the identified cumulative developments would be expected to lead to cumulative increases in housing provision, employment, and expenditure.

6.224 Table 6.11 illustrates the projected effects on local population and housing.

Table 6.14: Projected Local Population and Housing

Name	Housing Provision (units)	Additional Population (people) ²⁰	Employment Provision (FTEs) ²¹
Land at Owl Lane	252 dwellings	635 people	0 people
Land to the south of Heybeck Lane	181 dwellings	456 people	0 people
Total for cumulative developments	433 dwellings	1,091 people	0 people

²⁰ Indicative number calculated by multiplying units numbers with 2018 ONS average household size for Dewsbury East and Batley East; for hotel uses it is assumed at maximum capacity the hotel rooms would accommodate two persons.

²¹ Calculated using the Employment Densities Guide 3rd addition, and information of the floorspaces and uses made publically available within the relevant planning application.

Name	Housing Provision (units)	Additional Population (people) ²⁰	Employment Provision (FTEs) ²¹
Total for Proposed Development plus committed development	1,787 dwellings	4,503 people	3,019 FTE jobs

Local Population

- 6.225 Effects on population are expected to be due to an increased number of people within the area, as a result of additional housing provision.
- 6.226 Using data from the relevant planning applications and the average household size for KMDC, it is anticipated the cumulative effect on population would be 4,503 additional residents within the area.
- 6.227 Although the cumulative effect of additional people in the area could add pressure to local services, it would also draw expenditure into the area and contribute to multiplier effects and economic growth.
- 6.228 Therefore, on balance it is considered that the cumulative effect of an additional population in the area would be **minor beneficial**.

Housing

- 6.229 The cumulative effect of all of the committed developments would present a number of new residential units being brought forward within the area leading to an increase in the supply of housing. These developments would provide 1,787 residential units, equating to 103% of the annual objectively assessed need in the Local Plan, however the Proposed Development is expected to be phased over a number of years.
- 6.230 The above illustrates the significant contribution the Proposed Development will have to housing targets. Therefore, cumulative effects of housing provision are considered to be **major beneficial**, and permanent.

Employment

- 6.231 None of the cumulative development are providing employment floorspace. Therefore the cumulative effect on employment is estimated as an additional 3,019 operational jobs. It is also anticipated that further jobs would be created through supply chains and through multiplier effects.
- 6.232 The Local Plan states that approximately 23,000 FTE net new jobs will need to be provided by 2031 in order to meet the objectively assessed jobs need, to which the cumulative effect of the developments would contribute 35.5% of this target.
- 6.233 Cumulative effects on employment are considered to be of **moderate beneficial** significance, and permanent.

Local Expenditure

- 6.234 Effects on local expenditure are difficult to accurately quantify. It is considered that the cumulative effects of an estimate 4,503 additional residents and 3,019 workers across the Proposed Development and cumulative developments would increase spending on comparison and convenience goods, and would be expected to lead to multiplier effects and generate further employment. It is estimated that £36.7m would be spent in the local area by these residents per annum, and £2.48m spent on lunch by workers per working year.
- 6.235 Considering the above, the cumulative effects of expenditure are considered to be positive and therefore it is considered that the cumulative effect would be of **major beneficial** significance, and permanent.

Healthcare Facilities

- 6.236 Considering cumulative effects on primary healthcare facilities, it is noted that the additional residential committed developments are located within a relatively local area in relation to the Site and some residents would seek access to the same primary healthcare facilities as the Proposed Development. Therefore this could create a cumulative impact as there will be increased pressure on the same facilities.
- 6.237 However, the residents of the committed developments would access a greater number of primary healthcare facilities which reduces the likely cumulative effect. Notwithstanding this, some cumulative effects would be expected to be spread across a wider area with the committed developments expected to benefit from access to additional healthcare facilities due to their location. With those schemes further away from the Site, cumulative effects would be expected to be less than those located closer to the Site.
- 6.238 Residential uses would be expected to give rise to an additional population requiring access to local healthcare facilities.
- 6.239 Of those schemes which propose new non-residential uses these would not be expected to increase demand upon healthcare facilities, and so cumulative effects are not anticipated.
- 6.240 Although there are GPs and dentist surgeries accepting patients near to the Site, it is not known whether there is sufficient capacity for the relevant facilities across the wider area to absorb the additional cumulative residents.
- 6.241 The effect of the Proposed Development on healthcare facilities, in isolation, is assessed as minor adverse. Cumulative adverse effects on healthcare could result if all of the (residential) committed developments came forward without mitigation. It is expected that where adverse effects are identified as part of the individual committed developments then appropriate mitigation measures would be investigated and implemented as part of the planning process. Mitigation will likely be in the form of financial contributions secured through S.106 agreements towards healthcare facilities and/or provision. Therefore, following mitigation, the cumulative effects on the primary healthcare system are assessed as **minor adverse**.

Education

- 6.242 Residential uses may lead to an additional school age population who require access to educational facilities.
- 6.243 There are a number of primary and secondary schools in appropriate proximity from the Site, however it is not known whether there is sufficient capacity to facilitate the potential increase in demand.
- 6.244 The effect of the Proposed Development on educational facilities, in isolation, is assessed as negligible. The baseline data finds that approximately 25.8% of the Dewsbury East and Batley East ward is of school age. Applying this percentage to the potential cumulative population of committed developments there is the potential for 1,161 additional school aged children within the local area.
- 6.245 As the capacity of local education facilities is not fully known, it could be that cumulative adverse effects may occur if all the residential committed developments came forward without any mitigation measures as part of the planning process. Mitigation measures are likely to take the form of financial contributions in order to mitigate any adverse effects with respect to local education facilities. The Proposed Development includes a two-form entry primary school. Following mitigation, the cumulative effects on the education system are assessed as **negligible**.

Open Space, Recreation and Amenity

- 6.246 Effects on open space, recreation and amenity resulting from the Proposed Development are considered to be minor beneficial. The effect on open space and amenity provision resulting

from the surrounding cumulative schemes is not known, however it is expected that they would have regard to the relevant policy guidelines.

6.247 Some of the committed developments include spaces for use by future residents and members of the public. This in-built mitigation is considered to lessen the potential effects on open space, recreation and amenity in surrounding areas resulting from an increased population. In this context cumulative effects on open space, recreation and amenity are judged to be **negligible**.

Crime

6.248 Effects on crime resulting from the Proposed Development are considered to be minor beneficial. The effect on crime resulting from the surrounding cumulative schemes is likely to be beneficial as they would be expected to accord with the relevant Secured by Design guidelines.

6.249 The provision of new residential and employment uses would increase activity within the local area, and might be expected to reduce opportunities for crime.

6.250 Overall, the cumulative effect on crime is assessed as **minor beneficial**, and permanent.

Summary

6.251 A socio-economic assessment has been conducted to identify the likely significant effects of the Proposed Development with respect to the following factors:

- Local Population (during the operational phase);
- Housing (during the operational phase);
- Employment (during construction and operational phases);
- Local Expenditure (during construction and operational phases);
- Healthcare Facilities (during the operational phase);
- Education (during the operational phase);
- Open Space, Recreation and Amenity (during the operational phase); and,
- Crime (during the operational phase).

6.252 The assessment considered the impacts of the Proposed Development during the demolition and construction and the operational phases to identify any potentially significant effects and to ascertain any requirement for incorporating mitigation measures.

6.253 A construction phase assessment for housing, healthcare facilities, education, crime, and open space, recreation and amenity was scoped out as workers are not likely to be housed either on-site or nearby during this stage of the Proposed Development, and therefore will not result in a permanent addition to the local population. Crime was scoped out of the construction phase assessment because significant effects during the construction phase are unlikely.

6.254 Published statistics and information in the public domain have been collected to establish the baseline conditions. The assessment has been carried out using a combination of quantitative methods, published formulae and qualitative approaches based on industry best practice, guidance, professional judgement and experience of other major mixed use development projects.

- 6.255 Where appropriate, the assessments have considered the 'worst case scenario' (ie completion of the entire Proposed Development????) to ensure a robust assessment of the Proposed Development.
- 6.256 During the construction phase, approximately 121 full time equivalent (FTE) jobs are likely to be created at the Site, resulting in a temporary, moderate beneficial effect on the local employment market, and equivalent to an approximate 1.3% increase in employment in the Dewsbury East and Batley East wards. Total job creation would amount to more than this figure, when taking indirect job creation into account from increased demand within the supply chain. This would result in a temporary, **major beneficial** effect on local employment.
- 6.257 Local expenditure would also increase during the construction phase, due to the presence of construction workers making use of local facilities during lunchbreaks for example. This would result in temporary, **moderate beneficial** effects on the economy in the local area.
- 6.258 On completion of the Proposed Development, once the 1,354 residential units are occupied and in use, there would a permanent increase in population of approximately 3,412 people at the Site. The effects on the local population are considered to be **minor beneficial** and will make a significant contribution to meeting the housing target identified in the KMDC Local Plan and is therefore considered to be **moderate beneficial**.
- 6.259 Approximately 3,019 FTE jobs will be created at the Site as a result of the employment-generating uses. This job creation is considered to result in a permanent, **major beneficial** effect on the local economy.
- 6.260 Local retail expenditure is anticipated to increase due to spending by future residents and employees of the Proposed Development, in local shops, cafes and restaurants nearby and in the small retail use proposed. Effects on local expenditure are considered to be of **moderate beneficial** significance to the local economy and permanent in nature.
- 6.261 The effect of the Proposed Development on the capacity of primary healthcare facilities in the vicinity of the Site is assessed as minor adverse. There are 25 GP surgeries and 5 dental surgeries located within three miles of the Site who are accepting new NHS patients. It is considered that the majority of the additional demand for GPs could be absorbed by the existing healthcare facilities. The effects are therefore assessed as of **minor adverse** significance.
- 6.262 The potential school-aged population forms a 25.8% proportion of the Proposed Development, which includes a two-form entry primary school with early years provision, therefore the impact on local education facilities is assessed as **minor beneficial**.
- 6.263 The Site is located within an area which has relatively good access to open space for recreation and amenity, and the Proposed Development will provide amenity and recreational space which will benefit both users of and visitors to the Site. Overall, the effects of the Proposed Development on open space, recreation and amenity at the local scale are therefore considered to be **moderate beneficial**.
- 6.264 The Proposed Development incorporates measures to 'design out' crime, and will be built in accordance with Secured by Design standards. Such elements include increasing natural surveillance and active frontages around the Site, and it is expected that CCTV would also be included as part of the employment uses proposals. The incorporation of these measures into the Proposed Development is expected to result in a reduction for opportunities for crime in and around the Site. The inclusion of appropriate lighting, particularly at night-time, routes increasing connectivity within and through the Site, and the overall addition of a new population is expected to have a beneficial effect upon crime and reducing opportunities for crime. Overall, the effect on crime is assessed as **minor beneficial** at the local scale.
- 6.265 Table 6.15 below summarises the predicted effects of the scheme on the socio-economic indicators that were assessed, including cumulative effects.

6.266 Overall, the assessment has concluded that the impact of future residents on existing neighbourhood services is not expected to give rise to significant effects, and so the Proposed Development would not be expected to detrimentally impact on existing residents.

Table 6.15: Summary of Socio-Economic Effects Assessment

Issue	Phase	Effect (pre-mitigation)	Residual Effect	Cumulative Effect
Local Population	Construction	n/a	n/a	n/a
	Operation	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial
Housing	Construction	n/a	n/a	n/a
	Operation	Major Beneficial	Major Beneficial	Major Beneficial
Employment	Construction	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial
	Operation	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial
Local Expenditure	Construction	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial
	Operation	Major Beneficial	Major Beneficial	Major Beneficial
Healthcare Facilities	Construction	n/a	n/a	n/a
	Operation	Moderate Adverse	Moderate Adverse	Minor Adverse
Education	Construction	n/a	n/a	n/a
	Operation	Minor Beneficial	Minor Beneficial	Minor Beneficial
Open Space, Recreation and Amenity	Construction	n/a	n/a	n/a
	Operation	Minor Beneficial	Minor Beneficial	Negligible
Crime	Construction	n/a	n/a	n/a
	Operation	Minor Beneficial	Minor Beneficial	Minor Beneficial

Note: n/a = not assessed

Reference List

- English Partnerships (2014), Additionality Guide – A Standard Approach to Assessing the Additional Impacts of Interventions (Fourth Edition), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/378177/additionality_guide_2014_full.pdf
- <http://www.ons.gov.uk/ons/index.html>

- NHS Choices <https://www.nhs.uk/service-search/>
- Visa Lunchtime Spend Research <https://www.visaeurope.com/media/pdf/17590.pdf>
- Employment Densities Guide, 3rd Ed. (2015). OffPAT and HCA.
- <https://www.n-kesteven.gov.uk/visitors-and-leisure/sports-leisure-culture-and-the-arts/countryside-and-open-spaces/>
- <https://www.n-kesteven.gov.uk/central-lincolnshire/policies-map-and-interactive-map/>
- IOD2019 Explorer http://dcigapps.communities.gov.uk/imd/iod_index.html
- <https://www.get-information-schools.service.gov.uk/Establishments/Search?tok=zfA1aLgv>
- ONS Annual Business Survey, 2016, released May 2018.

7 Landscape and Visual Impacts

Introduction

- 7.1 This chapter has been prepared by re-form landscape architecture Ltd, a registered practice of the Landscape Institute. This assessment was carried out by Chris Gilbert, a Chartered Member of the Landscape Institute with over 19 years' experience and landscape visual assessment, with additional support from Philippa Lewis, also a Chartered Member of the LI with over four years' experience of landscape and visual assessment. The assessment was overseen by director Andrew Price, a chartered landscape architect with over 15 years' experience.
- 7.2 This chapter assesses the likely significant effects of the Proposed Development with respect to landscape fabric and character, and visual amenity. This assessment is based on the parameter plans. A full Landscape and Visual Assessment (LVA) is appended (appendix 7.1), which assesses the likely effects of the illustrative masterplan. While the illustrative masterplan is underpinned by the parameter plan, it is not the subject of this assessment. This chapter is also accompanied by appendix 7.1 which describes in detail the methods used to assess the effects and appendix 7.2 which includes the figures referred to within this chapter. This chapter details the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 7.3 This chapter is structured as follows:
- i. Description of the Site and its immediate context in general terms, identifying the location and its main characteristics;
 - ii. Identification of the relevant planning policy context at national and local level that is pertinent to landscape character and visual issues;
 - iii. Identification of baseline criteria of the Site which are to be used to inform the assessment of landscape and visual effects is established;
 - iv. Description of the methodology for establishing the landscape and visual effects; this determines the assessment of the landscape and visual effects of the existing Site and the Development;
 - v. An assessment of the landscape and visual effects of the development in relation to the baseline conditions, with and without landscape mitigation;
 - vi. A summary of the findings and conclusions.
- 7.4 The LVA forms part of an outline planning application. This chapter will demonstrate that the Site, the local landscape within the vicinity of the Site, and the study area vary in sensitivity, but have the capacity to receive the Proposed Development.
- 7.5 The Site, covering c.112ha, is located c.2.5km north-east of Dewsbury town centre on agricultural land currently in arable production (**Figure 1.1 within appendix 7.1**). This land is surrounded on most sides by existing residential development, though to its north-east,

east, and south there is a buffer of agricultural land which maintains a degree of separation from West Ardsley, the M62 motorway and Gawthorpe, respectively (**Figure 1.2 within appendix 7.1**). Surrounding residential development dates largely from the mid to late twentieth century, though there are a few older industrial and preindustrial properties too. Existing housing is generally set higher than adjacent areas within the Site, and its regions of the Site represent the lowest points in the landscape, before it falls away to the east (**Figure 1.3 within appendix 7.1**). The agricultural landscape within and just beyond the Site includes a number of mature hedgerows, hedgerow trees and two sizable tree copses known as Dum Wood and Dogloitch Wood (located 15m from the Site's northern and eastern boundaries). Access to the Site is gained from Leeds Road to the west and from Chidswell Lane to the south.

- 7.6 There are no designations that apply to the Site, other than Tree Preservation Orders (**Figure 1.4 within appendix 7.1**).

Legislative and Policy Context

National Planning Policy

- 7.7 The NPPF (revised 2019)²² sets out the Government's planning policies for England and how these are expected to be applied. The NPPF promotes a presumption in favour of sustainable development, with paragraph 8b) emphasising the need for a well-designed built environment that encourages healthy, vibrant communities. Paragraph 127 stresses the need for development to respond to local character and to be visually attractive, as well as emphasising the integration of development into the environment. Paragraph 171 seeks to ensure that the planning system contributes to and enhances the natural and local environment, and outlines the benefits of green infrastructure.
- 7.8 Planning Practice Guidance (PPG) ⁱⁱⁱ²³ supports the use of landscape character assessment as a tool for understanding local distinctiveness and Natural England's guidance on landscape character assessment. PPG also refers to the risk of artificial lighting undermining the enjoyment of the countryside and night sky and provides guidance for mitigation-by-design of artificial lighting.

²² National Planning Policy Framework (revised February 2019)

²³ Department for Communities & Local Government, Planning Practice Guidance

Local Planning Policy

- 7.9 The Site falls within the administrative area of Kirklees Council. The Kirklees Local Plan (2019) forms the current development plan for Kirklees²⁴. The Local Plan provides planning policy within the context of the issues and challenges of Kirklees.
- 7.10 The Local Plan (adopted 27 February 2019) replaces the policies of the previous Unitary Development Plan (adopted March 1999), and covers the period 2013-2031.
- 7.11 Policy LP1 covers the presumption in favour of sustainable development, which brings the Local Plan in line with the overarching objective of the NPPF.
- 7.12 Local Plan policies of relevance to landscape and visual amenity are summarised below:

Strategic Objective 6: Protect and improve green infrastructure to support health and well-being, giving residents access to good quality open spaces, sport and recreation opportunities, and to support habitats, allowing wildlife to flourish.

- 7.13 The above policy is relevant to the retention of existing green infrastructure assets within and just beyond the Site, including hedgerows, trees, woodland and water courses, and to the Proposed Development which should seek to further enhance and strengthen these.

Strategic Objective 8: Promote and enhance the characteristics of the built, natural and historic environment, and local distinctiveness which contribute to the character of Kirklees, including the South Pennine Moors, Moorland fringe and the area's industrial heritage.

Policy PLP 2 Place Shaping

All development proposals should seek to build on the strengths, opportunities and help address challenges identified in the Local Plan, in order to protect and enhance the qualities which contribute to the character of these places, as set out in the four sub-area statement boxes.

- 7.14 The above policies are relevant to the Proposed Development in that it should seek to respond to and complement positive characteristics of its existing landscape context, composed of the Site and wider study area.

Policy PLP 3 Location of new development

Development proposals will be required to reflect the Spatial Development Strategy, Policy PLP1 Achieving Sustainable Development and Policy PLP2 Place Shaping. This means:

1) Development should reflect the settlement's size and function...

2) Development will be permitted where it supports the delivery of housing and employment growth in a sustainable way, taking account of the following criteria:

...e. ensuring that proposals have regard to connecting links to existing green and blue infrastructure networks...

Policy PLP 5 Masterplanning Sites

...Masterplans will be expected to achieve the following (proportionate to the scale of the development):

²⁴ Kirklees Local Plan

...b) high standards of design that respect the character of the landscape, heritage, adjacent and nearby settlements and built development, reflecting the urban to rural transition with appropriate boundary treatment;

c) make effective use of the site through the application of appropriate densities in terms of scale, height and massing, and its relationship to adjoining buildings and landscape;

d) create a strong sense of place, ensuring the Proposed Development makes a positive contribution to local character and distinctiveness;

l) a green infrastructure strategy, providing an integrated network of green spaces;

o) demonstration of a good understanding and respect for the natural environment, its heritage assets and their setting both within the site and in the wider locality, whether designated or not, and include details of how the natural environment and heritage assets will be conserved and enhanced.

7.15 The above policies are relevant to the Proposed Development, as it should ensure that proposed built form and green/blue infrastructure complement one another and fit sympathetically into their existing urban fringe context, forming a sustainable urban extension to Dewsbury.

Policy PLP 24 Design

Good design should be at the core of all proposals in the district...

Proposals should promote good design by ensuring:

a) the form, scale, layout and details of all development respects and enhances the character of the townscape, heritage assets and landscape;

b) they provide a high standard of amenity for future and neighbouring occupiers; including maintaining appropriate distances between buildings and the creation of development-free buffer zones between housing and employment uses incorporating means of screening where necessary;

g) any new open space is accessible, safe, overlooked and strategically located within the site and well-integrated into wider green infrastructure networks;

h) development contributes towards enhancement of the natural environment, supports biodiversity and connects to and enhances ecological networks and green infrastructure;

i) the retention of valuable or important trees and where appropriate the planting of new trees and other landscaping to maximise visual amenity and environmental benefits.

7.16 The above policy is relevant as the Proposed Development should address the relationship between proposed residential and commercial development, and ensure that this is complemented by well-designed green infrastructure. The latter should incorporate existing site assets (hedgerows, trees, watercourses etc) and augment these in a network of accessible greenspaces for the benefit of existing and future residents.

Policy PLP 30 Biodiversity & Geodiversity

The Council will seek to protect and enhance the biodiversity and geodiversity of Kirklees, including the range of international, national and locally designated wildlife and geological site, Habitats and Species of Principal Importance and the Kirklees Wildlife Habitat Network.

Local Designated Sites & Important Local Ecological Features

Proposals having a direct or indirect adverse effect on a ... Ancient Woodland, Veteran Tree or other important tree, will not be permitted unless the development can be shown to be of an overriding public interest and there is no alternative means to deliver the proposal. In all cases, full compensatory measures would be required and secured in the long term.

Policy PLP 31 Strategic Green Infrastructure Network

Within the Strategic Green Infrastructure Network identified on the Policies Map, priority will be given to safeguarding and enhancing green infrastructure networks, green infrastructure assets and the range of functions they provide.

Development proposals within and adjacent to the Strategic Green Infrastructure Network should ensure:-

- i) The function and connectivity of green infrastructure networks and assets are retained or replaced;*
- ii) New or enhanced green infrastructure is designed and integrated into the development scheme where appropriate, including natural greenspace, woodland and street trees;...*

Policy PLP 32 Landscape

Proposals should be designed to take into account and seek to enhance the landscape character of the area considering in particular:

B: the setting of settlements and buildings within the landscape;

C: the patterns of woodland, trees and field boundaries;

D: the appearance of rivers...and other water features within the landscape.

Policy PLP 33 Trees

The Council will not grant planning permission for developments which directly or indirectly threaten trees or woodlands of significant amenity.

Proposals should normally retain any valuable or important trees where they make a contribution to public amenity, the distinctiveness of a specific location or contribute to the environment, including the Wildlife Habitat Network and green infrastructure networks.

Proposals will need to comply with relevant national standards regarding the protection of trees in relation to design, demolition and construction. Where tree loss is deemed to be acceptable, developers will be required to submit a detailed mitigation scheme.

Policy PLP 35 Trees

3. Proposals should retain those elements of the historic environment which contribute to the distinct identity of the Kirklees area and ensure they are appropriately conserved...Consideration should be given to the need to:

- a. ensure that the proposals maintain and reinforce local distinctiveness and conserve the significance of designated and non-designated heritage assets.*

- 7.17 The above policies are relevant as the Proposed Development should ensure that existing landscape assets, within and in close proximity to the Site (e.g Dum Wood and Dogloitch Wood, individual trees, hedgerows, and water courses) are protected from adverse effects resulting from the Site's development. Furthermore, these assets should be connected to a wider green infrastructure proposal in the interests of increasing biodiversity, extending habitats and wildlife corridors, improving the setting of proposed built form, and promoting healthy living amongst residents.
- 7.18 Within the Local Plan the Site is allocated for development under Policy MXS7 Mixed Use, covering 120.78ha.

Assessment Methodology and Significance Criteria

- 7.19 Please refer to Appendix 7.2 for detailed information regarding the assessment methodology and significance criteria.

Limitations and Assumptions

- 7.20 Representative viewpoints have been presented in a format that best describes the Site in its surrounding landscape context. The resulting panoramic photographs have been presented on double-spread A3 pages in order to clearly describe, and allow comparison of, the existing Site and the developed Site together, and to facilitate printing at a practical paper size. This approach diverges slightly from paragraph 5.2 of the Landscape Institute's Advice Note 01/11 for Photography and Photomontage in Landscape and Visual Impact Assessment.
- 7.21 Though computer modelling of the Proposed Development, together with the setting of viewpoints within the model has been undertaken with a high degree of accuracy, the subsequent montaging of the computer model into photographs has been executed with a degree of judgement on the part of the landscape architect. The landscape architect feels that this is acceptable given the general nature of the information provided by the Parameter Plans, on which the proposed montaged viewpoints are based. The photographs depicting the existing situation, Proposed Development without mitigation, and Proposed Development with mitigation have been presented on double-spread A3 pages in order to fully communicate the visual changes within the wider context of the Site.
- 7.22 The modelling of the Proposed Development is based on the following assumptions:
- 7.23 The finished floor level of the buildings is based on existing topography and, where possible, proposed levels provided by the engineer.
- 7.24 The dashed line indicating the upper limit of the parameter plans refers to the maximum building height shown on the Proposed Parameter Height – Maximum Building Height. No surface finishes are shown, and the appearance of the buildings is intended for illustrative purposes and should not be regarded as detailed, photorealistic finishes.

Baseline Conditions

- 7.25 The following are key issues in respect of the landscape and visual baseline conditions:
- i. Location and character of landscape elements and components which contribute to the landscape character
 - ii. Identification of key receptors and their sensitivity.

- iii. Determination of the existing landscape character and visual quality of the Site.
- iv. The ability of the existing landscape to accommodate change.
- v. The likely effects of development within the landscape – whether it is negative or positive, including:
 - 1) Potential landscape effects on the existing landscape character of the Site and its context
 - 2) Potential visual effects on views into, out of and across the Site

Landscape Baseline

- 7.26 This section describes the principal spatial and built form components which give the Site and surrounding area its particular characteristics. The relevance of these components is identified and described below.
- 7.27 For the purposes of this assessment the following elements are considered relevant in determining the character of the study area: settlement form, existing topography, agricultural land, vegetation (hedgerows and trees), water courses, sense of tranquillity and sense of openness.
- 7.28 Baseline information was gathered using a combination of desk-based and field-based studies. Information relating to landscape designations was obtained using Ordnance Survey data, including MagicMap, published online by DEFRA. The conditions were recorded in August 2018.

Existing Landscape Character

- 7.29 Landscape assessment encompasses appraisal of physical, aesthetic and intangible attributes including sense of place, rarity or representativeness, and unspoilt appearance. The combination of landscape elements (trees, hedgerows, woodlands, settlement and buildings, their architecture and fabric) and their arrangement give the different areas a unique sense of place, or 'character'. These aspects, together with scale and character of surrounding landscapes, patterns and scale of landform, land cover and built development, need to be taken into account when assessing landscape effect.
- 7.30 Natural England has produced a National Character Area (NCA) Map for England, which identifies broad areas of distinct and individual countryside character. The character map takes account of the physical landform and the effect of human activities on the natural world. The national framework of character areas identifies and describes the diversity of landscape character across England and provides a common starting point for more detailed local assessments. **Figure 1.5 within appendix 7.1** illustrates the position and extent established national and local character areas relevant to the Site and wider study area. Photographs of features typical to each character area are presented in **Figure 1.6 within appendix 7.1**.
- 7.31 The Site lies within or in close proximity to a number of established character area. These are:
- National Character Area (NCA) 38: Nottinghamshire Derbyshire and Yorkshire Coalfields, as defined by Natural England.^{v25}

²⁵ National Character Area (NCA) 38: Nottinghamshire Derbyshire and Yorkshire Coalfields, as defined by Natural England

- Local Character Area (LCA) E8: Batley-Dewsbury Rural Fringes, as defined by the Kirklees District Landscape Character Assessment. ^{vi26}
- LCA Northern Coal Field, as defined by the Landscape Character Assessment of Wakefield District. ^{vii27}
- LCA Arable Fringe Farmland, as defined by the Leeds Landscape Assessment. ^{viii28}

7.32 The Site lies within **National Character Area (NCA) 38**: Nottinghamshire Derbyshire and Yorkshire Coalfields. Key Characteristics of the NCA, displayed by the Site and study area:

- *A low-lying landscape of rolling ridges...underlain by Pennine Coal Measures.*
- *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...with field boundaries of clipped hedges or fences.*
- *Many areas affected by urban fringe pressures creating fragmented landscape, some with a dilapidated character, separated by substantial stretches of intact agricultural land in both arable and pastoral use.*
- *Widespread influence of transport routes, including...roads...with ribbon developments emphasising the urban influence in the landscape.*
- *Continuing development pressure including land renewal and regeneration projects, especially along river corridors and around towns.*

Landscape Sensitivity of NCA 38: Nottingham Derbyshire and Yorkshire Coalfields

- 7.33 The rolling topography of NCA 38 is characterised by a rural landscape displaying significant urban fringe pressures. Relatively large open fields within the NCA are typically delineated by intermittent and overgrown hedgerows. The rural landscape is encroached upon by largely twentieth development, including residential areas and road infrastructure. Generally, the landscape has a relatively weak structure with mixed characteristic patterns of landform and landcover. There are limited features worthy of conservation, while there are frequent detracting features, such as pylons and the M1 motorway. The quality of the general landscape is judged to be poor.
- 7.34 Despite its developed character, the urban fringe environment provides a semi-natural environment which can be accessed and enjoyed from a number of nearby settlements via a network of PROWs and local roads. Considering the quality of the landscape, together with its amenity functions, the NCA is judged to be of moderate value.
- 7.35 The characteristics of the NCA, the nature of the Proposed Development and its scale mean that the NCA has an ability to accommodate the Proposed Development without adverse consequences for the retention of the existing landscape baseline. The susceptibility of the NCA is therefore judged to be low.
- 7.36 Taking into consideration the value of the NCA and its susceptibility to the Proposed Development, the sensitivity of the NCA 38: Nottingham Derbyshire and Yorkshire Coalfields is

²⁶ Local Character Area (LCA) E8: Batley-Dewsbury Rural Fringes, as defined by the Kirklees District Landscape Character Assessment

²⁷ LCA Northern Coal Field, as defined by the Landscape Character Assessment of Wakefield District

²⁸ LCA Arable Fringe Farmland, as defined by the Leeds Landscape Assessment

judged to be medium low. For the purposes of this assessment, the higher of these two levels is adopted, making the sensitivity medium.

- 7.37 The Site falls within **Local Character Area (LCA) E8: Batley-Dewsbury Rural Fringes**, as defined by Kirklees Council's Landscape Character Assessment. This LCA is composed of nine units of rural fringe land, located in different parts of the district. The Site is located in the unit of rural fringe land north-east of Dewsbury. The landscape of the Site and its surrounding area display the following key characteristics, consistent with the LCA:

Topography, geology and drainage

- *Gently undulating land, found between approximately 100 and 200 metres altitude. However, the Site lies on ground between 70 and 125m altitude.*
- *Local variations in topography create areas of more complex landform, including some elevated ridges and hills and parts where the slopes are deeply incised by valleys.*
- *Bedrock geology consists of the Pennine Coal Measures formation typical of much of the district, with areas of alluvium deposits associated with watercourses.*

Woodland Cover

- *Varied tree cover, with trees in shelterbelts, along field boundaries and some areas of broadleaved woodland, which follow streams.*

Land use and field patterns

- *Typical pattern of small scale grassland pastures with some more limited areas of more intensive arable cultivation.*
- *Urban expansion and associated land uses spreading into the farmland landscape, including horse paddocks and equestrian enterprise.*
- *Mix of field boundary types including stone walls, hedgerows and fences.*

Semi-natural habitats

- *Isolated remnants of species-rich grasslands (hay meadow and wet pastures) exist within the improved grassland...*
- *Some of the areas of broadleaved woodland are also locally important for wildlife, including Dogloitch Wood and Dum Wood.*

Archaeology and cultural heritage

- *There are numerous Listed Buildings...Traditional stone-built cottages, Victorian terraces and farmsteads provide a contrasting historic sense of place within the urban context.*

Settlement and Road Pattern

- *A fragmented landscape forming urban fringe pockets within and around the Dewsbury, Baltey, Mirfield, Liversedge and Cleckheaton conurbation.*
- *A dense network of A roads, minor roads and narrow winding lanes link the LCA's small villages to the surrounding urban centres.*

Views and perceptual qualities

- *There are distant views from elevated ridgelines.*
- *Some areas still retain a relative sense of tranquillity and rural character, however increasing urbanisation creates a landscape of transition.*
- *Away from settlements this landscape forms pockets of relative rural tranquillity amongst extensive development, although large scale pylons, busy roads and urban fringe land uses detract from these qualities.*

Role as a setting to development

- *The LCA forms a backdrop to a large number of settlements due to its scattered urban fringe location.*

Sensitivity of LCA E8: Batley-Dewsbury Rural Fringes

- 7.38 The LCA has some valued characteristics including a Listed Monument at Howley Hall (ref 1016323), several Grade II Listed Buildings, pockets of ancient replanted woodland, and a number of Tree Preservation Orders. Its character is, however, compromised by some detracting elements such as large pylons, and by its inter-visibility with neighbouring residential areas (generally composed of large-scale housing dating from the twentieth century) and road infrastructure, including the M1 motorway located c.1.5km to the east. Despite these detracting elements, the LCA still plays a role as a setting for development.
- 7.39 Due to its proximity to a number of residential areas, the semi-natural landscape provides visual amenity, and also serves a recreational function through its extensive network of PROWs. These provide access to relatively tranquil places, set within a highly developed landscape.
- 7.40 The Local Plan designates some regions of the LCA as Green Belt, though the Site itself no longer carries this designation as it has been allocated for development (Land at Chidswell, allocation MXS7 Mixed Use, covering 120.78ha).
- 7.41 This unit of the LCA provides visual amenity to surrounding residential areas, and also offers recreational benefits through its extensive network of PROWs. It contributes to openness and a sense of tranquillity, amidst more developed areas of the landscape, and is likely to be viewed as a vestige of the pre-industrial era.
- 7.42 The quality of the landscape is judged to be good as its constituent elements, such as hedgerows and woodland are relatively intact, though there are some detracting elements, such as large pylons. Taking the above into consideration, this unit of the LCA is judged to be of moderate *value*.
- 7.43 Considering the large scale, highly developed nature of the Proposed Development in relation to this unit of the LCA, the *susceptibility* of the LCA is judged to be medium.
- 7.44 The resulting *sensitivity* of the LCA E8: Batley-Dewsbury Rural Fringes is judged to be medium.
- 7.45 The Site also lies adjacent to **LCA Northern Coal Field**, which displays the following characteristics:
- *The highest land is in the western side of the district.*
 - *The valleys radiate north westwards from Wakefield.*
 - *The oldest cores of settlement are generally located on spurs or ridges of high ground...*

- *The towns...expanded largely as a result of the coal industry, and its subsequent collapse has left parts of the area in economic decline and in need of regeneration.*
- *Much of the area is urbanised, and the remaining countryside exhibits many characteristics of the urban fringe.*
- *The surviving open landscape is intensively farmed with few areas of trees and a decreasing cover of hedgerows and hedgerow trees, much of it is urban fringe and is of an ecologically degraded character.*
- *The largely arable landscape consists of large open fields. Many hedgerows have been removed as a consequence of intensifying farming and opencast mining. Surviving hedgerows are in decline, ancient landscape patterns are virtually obliterated. Arable agriculture is dominant. Horse keeping is the main type of grazing.*
- *There are very few areas of woodland and open water, surviving elements appear to be as a result of recent plantation and restoration.*
- *The M1 cuts through in north-south direction, is a dominant feature in the valley and acts as a significant barrier between Ossett/Horbury and Wakefield City.*

Sensitivity of LCA Northern Coal Field

- 7.46 The landscape is characterised by large open fields, intermittent or overgrown hedgerows with few hedgerow trees, small tree copses and tree-lined becks that incise a rolling topography. Beyond the openness of the rural landscape, modern residential settlements are visible in all directions, and from high points within the landscape the M1 motorway can be seen to the east. The landscape has a relatively weak landscape structure with limited features worthy of conservation, and a number of detracting features, including large pylons. The quality of the landscape is judged to be poor.
- 7.47 However, this region of the LCA also lies within Green Belt, which serves to maintain openness between settlements. The designation keeps the northwards expansion of Gawthorpe in check, as well as the edges of East & West Ardsley. The designation will also keep in check the north-eastern and southern expansion of the Site. There are also a number of PROWs within this part of the LCA. These footpaths connect nearby settlements and provide recreational access to the countryside which includes relatively tranquil areas. Taking the above into consideration, together with the relatively poor quality of the landscape, the *value* of the LCA is considered to be moderate.
- 7.48 The LCA will not be directly affected by the Proposed Development, as the Site is located beyond its northern boundary. The Proposed Development will have some limited effect on openness, but this will not compromise the Green Belt function of land within the LCA. It is judged that the LCA is able to accommodate the Proposed Development without adverse consequences for the LCA or delivery of landscape planning policies. The *susceptibility* of the LCA is therefore judged to be low.
- 7.49 Combining judgements relating landscape value and landscape susceptibility, the *sensitivity* of the Northern Coal Field LCA is judged to be medium low. For the purposes of this assessment, the higher of these two levels is adopted, making the sensitivity medium.
- 7.50 Land abutting the northern corner of the Site is defined as **LCA Arable Fringe Farmland**. This is further subdivided into Landscape Unit LCM6 East Ardsley Fringe. This landscape unit displays the following key characteristics:
- *Gently undulating mixed farmland. Fields of arable and horticulture. Smaller fields of sheep and horse pasture than fringe areas further north. Wooded strips along becks. Small planted copses.*

- *Few hedgerow trees, increasing the open nature of much of the area, although trees occur in thin woodland strips along becks such as Hey Beck and in planted copses, helping shield developments.*
- *Where fields of arable or pasture have remained intact, there has been a gradual deterioration in their boundaries, with many hedgerows becoming gappy and overgrown.*
- *High density of village settlements. The area is densely settled, with villages of West and East Ardsley, Upper Green and Haigh Moss forming a continuous belt or urban development and linked by a network of roads, including main and minor roads and isolated old lanes.*
- *The area's dense road network, including the M1 motorway has further fragmented the farmland. Throughout, the fabric of the landscape is beginning to break down and the urban and highway influences such as the M1 motorway are apparent.*

Sensitivity of Landscape Unit LCM6 East Ardsley Fringe

- 7.51 The LCA has a fragmented quality. Pre-industrial field patterns, routes through the landscape, and water courses have been altered and encroached upon by pressures resulting from early industrialisation, and more recently by twentieth century residential development and road infrastructure. The resulting landscape has a weak structure, with mixed patterns of landform and land cover. It also displays a number of detracting features particularly at the interface with surrounding residential areas. The quality of the landscape comprising the LCA is judged to be poor.
- 7.52 However, a proportion of the LCA, located east of the Site, is designated as Green Belt. This designation keeps in check the southern expansion of East Ardsley, and also further expansion of the current housing allocation comprising the Site. In addition, there are a number of footpaths within the LCA which provide access to the countryside. For example, The Leeds Country Way, a strategic route encircling Leeds, runs through the LCA. Both the Green Belt designation and the various PROWs serve to increase the amenity value of the LCA. Taking into consideration both landscape quality and the amenity function of the landscape, the *value* of the LCA is judged to be moderate.
- 7.53 The susceptibility of the LCA to the Proposed Development is limited because the LCA is located beyond the boundary of the Site. All things considered, the LCA is judged to have the ability to accommodate the proposed intervention without adverse consequences for the retention of the existing landscape baseline or the delivery of landscape planning policies. The *susceptibility* of the LCA is therefore judged to be low.
- 7.54 Combining judgements of landscape value and landscape susceptibility, the *sensitivity* of Landscape Unit LCM6 East Ardsley Fringe is judged to be medium low. For the purposes of this assessment, the higher of these two levels is adopted, making the sensitivity medium.
- 7.55 Another relevant subdivision of the **Arable Fringe Farmland LCA**, is Landscape Unit LCM8 South Morley Fringe, located north of the Site. This Landscape Unit displays the following key characteristics:
- *The narrow belt of the South Morley Fringe is visually and physically separated from the urban area of Morley by the M62 motorway. As such, it appears to have been less affected by the pressures typical of an urban fringe landscape than areas further towards Leeds. However, these pressures are still evident.*
 - *Open and undulating area of arable fringe farmland. Fragmented arable farmland. Low gappy hedgerows. Steep sided wooded valley sides.*

- *As the land rises and levels out, the open ridge top displays some of the more fragmented urban fringe characteristics. Here, large, open fields of arable lie adjacent to smaller thin strips of horticulture, both bounded by low gappy hedgerows.*
- *The main urban edge of Morley is physically and visually separated from the farmland by the wide sweep of the M62 motorway.*
- *Distant views away from Leeds can be gained from the ridge top.*
- *Golf course, quarrying, opencast and landfill activities.*

Sensitivity of Landscape Unit LCM8 South Morley Fringe

- 7.56 Landscape Unit LCM8 South Morley Fringe displays many of the characteristics of other units comprising the Arable Fringe Farmland LCA, such as Landscape Unit LCM6 East Ardsley Fringe (noted above). The quality of the landscape is similarly poor.
- 7.57 Like LCM6, LCM8 is also designated Green Belt and has a number of PROWs including the Leeds Country Way, which serve to enhance its amenity function. The *value* of LCM8 is therefore judged to be moderate.
- 7.58 The landscape unit is judged to be able to accommodate the Proposed Development without adverse consequences for the retention of the existing landscape baseline or for the delivery of landscape planning policies. The *susceptibility* of Landscape Unit LCM8 South Morley Fringe is therefore judged to be low.
- 7.59 Taking both landscape value and landscape susceptibility into consideration, the *sensitivity* of Landscape Unit LCM8 South Morley Fringe is judged to be medium low. For the purposes of this assessment, the higher of these two levels is adopted, making the sensitivity medium.

Existing Landscape Fabric

Existing Settlement

- 7.60 'Settlement' is used in this assessment as a shorthand term for the pattern and inter-relationship of buildings and open space. A study of this pattern can contribute to an understanding of landscape and character to highlight the ratio of built form to open space as a precursor to defining landscape character.
- 7.61 The Site is located on the north-eastern fringes of the town of Dewsbury. The Site is composed of a large area of agricultural land, surrounded by suburban residential development on most sides. However, sizable buffers of agricultural land separate the Site from neighbouring residential areas to the north-east and south.
- 7.62 East & West Ardsley, situated north-east of the Site (and separated from it by a 340-680m wide buffer of agricultural land) are composed largely of mid to late twentieth century housing, consisting mainly of red brick semi-detached properties arranged along relatively straight streets and cul-de-sacs. Around the Baghill Road part of West Ardsley, there are a few older, industrial-era houses, built from stone and from brick.
- 7.63 To the west of the Site, residential development flanks the sides of Leeds Road (an arterial road which connects Dewsbury to the M62 motorway). Properties are mainly mid-century semi-detached two storey houses and bungalows, though there are older Victorian buildings too. To the east of Leeds Road (on the western edge of the Site) there is also a pre-industrial, stone-built farmstead, called Lees House Farm. Behind the houses that flank the Leeds Road, there are fields to the east (comprising the Site), and to the west. These fields are surrounded by fragmented residential development dating from preindustrial, industrial era, but now dominated by mid to late twentieth century houses.
- 7.64 Residential areas south-west of the Site are largely composed of late twentieth century houses arranged in cul-de-sacs and courtyards. Along Chidswell Lane, there are also a number of preindustrial cottages, including the Huntsman Inn public house. Just off Chidswell Lane, and on the southern edge of the Site, there are a number of large agricultural barns belonging to Windsor Farm. Further along the ridge, there is a water tower at Gawthorpe Reservoir. Overall, the pattern of development immediately south of the Site is heterogenous, and somewhat fragmented.
- 7.65 The settlement of Gawthorpe is separated from the Site's eastern boundary by c.600m of agricultural land. Gawthorpe is composed of a mix of industrial era rebrick/stone terrace houses, and late twentieth century houses, arranged along traditional streets that branch either side of Gawthorpe High Street.
- 7.66 Because existing settlement within the study area is, on balance; somewhat fragmented, typical of the region, common with scope for substitution, and of relatively low importance, its *value* is judged to be low.
- 7.67 The *susceptibility* of surrounding settlement is judged to be low as it has an ability to accommodate the Proposed Development without adverse consequences for the retention of the existing landscape baseline, or the delivery of landscape planning policies and strategies.
- 7.68 Taking value and susceptibility into consideration, the *sensitivity* of existing settlement in the study area is judged to be low.

Existing Topography

- 7.69 The Site falls in two directions, from south-west to north-east, and from north to south-east.
- 7.70 The highest point is at 120mAOD on the Site's south-western boundary near The Huntsman Inn public house, which lies on a local ridgeline. The northern-most high point sits at 110mAOD, near the junction of Heybeck Road with Leeds Road. Both high points fall to low ground on the eastern boundary of the Site which sits at c.75mAOD. Within this context, ground within and beyond the Site has a rolling character, incised by small streams.
- 7.71 The natural topography of the Site currently remains unaltered by human activity, other than very minor changes caused by agricultural activities. Although it does not display particularly outstanding features of regional or national interest, the condition and quality of the landform is judged to be good. As a defining characteristic of the wider landscape the value of the Site's topography is judged to be moderate.
- 7.72 The topography has some ability to accommodate the Proposed Development, though the construction of building foundations will bring about localised changes to ground levels. The susceptibility of the topography is therefore judged to be medium.
- 7.73 Taking both value and susceptibility into consideration, the sensitivity of the baseline topography is judged to be medium.

Existing Agricultural land

- 7.74 The Site is composed almost entirely of agricultural land given over to arable and mixed pasture, set in close proximity to the urban fringe. Field size varies, with larger fields located on high ground to the south and west, while smaller fields are located in the north and east. The smaller fields are remnants of the pre-industrial landscape. Field boundaries consist of hedgerows which are often intermittent and overgrown. The general condition and quality of the agricultural landscape comprising the Site is judged to be medium.
- 7.75 As well as its agricultural function, the landscape also has some cultural value in helping to convey a sense of land use history, and by providing visual amenity and access to the countryside. These aspects will be of value, particularly to local residents. Taking into consideration the quality of the agricultural landscape together with its amenity functions, the value of the agricultural landscape is judged to be moderate.
- 7.76 Since the Site's agricultural use will cease as a result of the Proposed Development, there will be little ability to accommodate the Proposed Development without adverse consequences for the retention of the existing landscape baseline. The susceptibility of the agricultural land is therefore judged to be high.
- 7.77 Combining judgements about value and susceptibility, the resulting sensitivity of the agricultural land is judged to be high medium. For the purposes of this assessment, the higher of these two levels is adopted, making the sensitivity high.

Existing Hedgerows

- 7.78 There is network of native hedgerows within the Site, which becomes progressively more concentrated towards the lower reaches of the Site where a smaller, pre-industrial field pattern exists. Some of the hedgerows in this part of the Site form part of the Local Plan's Green Infrastructure Network. Hedgerows bordering larger fields, particularly in the south-western part of the site are less intact, often displaying large gaps. As well as having a stock control function, this network of hedgerows also creates habitat wildlife, and makes an important contribution to the character of the landscape. Because of its varied condition, the network of hedgerows within the Site is judged to be of moderate value. Their susceptibility to the specific change is judged to be medium because of the potential difficulty in fitting modern

housing layouts into an existing field pattern. The resulting sensitivity is judged to be medium.

Existing Trees

- 7.79 Two ancient replanted woodlands, Dum Wood and Dogloitch Wood, sit within 15m of the Site's eastern boundary. Other wooded areas exist on the Site's south-western boundary. Within the Site, a number of trees, set in hedgerows, are covered by individual or group Tree Preservation Orders (TPOs). Most of the trees with TPOs are located in lower regions of the Site, roughly between Dum Wood and Dogloitch Wood. The condition and quality of trees across the Site and within woodland near the Site generally appears to be good.
- 7.80 The Ancient Woodland designation, TPO designation, and identification of Wildlife Habitat Networks (which connect designated sites of biodiversity and geological importance) together confer a high degree of value.
- 7.81 The susceptibility of trees within the ancient replanted woodland is low since Dum Wood and Dogloitch Wood sit outside the Site and would not be directly affected by development. The susceptibility of trees with TPOs to the Proposed Development is also judged to be low as it is likely that the great majority of these assets can be accommodated within the Proposed Development.
- 7.82 Combining judgements about value and susceptibility, the resulting sensitivity of trees is judged to be medium.

Existing Watercourses

- 7.83 The local watercourse, Hey Beck, runs in a south-easterly direction c.200m from the eastern boundary of the Site. However, a number of its tributaries, including agricultural ditches, flow from high ground, helping to shape the topography and habitat types within the Site. The condition and quality of the water courses appears to be good.
- 7.84 Since the water courses provide a means of draining surface water run-off away from the surrounding landscape, while also serving a useful wildlife function, the value of the watercourses is judged to be high.
- 7.85 The Proposed Development has potential to exert additional pressures on watercourses through increasing the rate of surface water run-off. However, there is some ability to accommodate the Proposed Development without adverse consequences for the existing baseline conditions. The susceptibility of the watercourse is therefore judged to be medium.
- 7.86 Combining judgements about value and susceptibility, the resulting sensitivity of watercourses is judged to be high medium. For the purposes of this assessment, the higher of these two levels is adopted, making the sensitivity high.

Existing PROWs

- 7.87 There is an extensive network of PROWs crossing the Site, which connect at various points to neighbouring fields, surrounding residential areas, to strategic PROWs including the Leeds Country Way and, further afield, the Kirklees Way. PROWs provide both routes and amenity.
- 7.88 The PROWs within the Site are in good condition. Because these long-established routes provide access to the countryside and provide useful connections to neighbouring areas, they are judged to be of high value. The value of the amenity they provide is in access to open countryside.
- 7.89 Though the character of the landscape through which they pass would be changed by the Proposed Development, it is likely that the routes themselves can be accommodated within the Proposed Development with no, or little, diversion. The susceptibility of the PROWs is

therefore considered to be low, balancing the retention of access with the potential reduction of amenity.

- 7.90 Combining judgements about value and susceptibility, the resulting sensitivity of the PROWs is judged to be medium.

Existing Sense of Tranquillity

- 7.91 The Site forms part of the rural fringe which sits between a number of residential areas. The rural fringe and urban fringe are well connected by an extensive network of PROWs, which provide good access to tranquil areas, away from extensively developed areas.
- 7.92 The sense of tranquillity within the Site is created not only by the physical extent of the space, but also by its topography, vegetation cover (including its network of hedgerows and wooded areas) and water courses. These landscape features combine to provide areas with varying degrees of openness and containment, experienced at different points along PROWs. The scale of the Site means that receptors can be some distance from existing houses and roads, creating many quiet areas within this rural fringe landscape. The quality of the tranquillity provided by the Site is therefore judged to be high.
- 7.93 Though the Site is not covered by a designation which recognises the landscape's tranquillity (as would be the case if it were designated an AONB, for example) the Site and wider rural fringe landscape is likely to be valued by a large number of people, particularly local people from the residential areas surrounding the rural fringe. The value of the sense of tranquillity currently offered by the Site is considered to be moderate.
- 7.94 If carefully designed, the Site has some ability to accommodate the Proposed Development while maintaining some tranquil areas. The susceptibility of the Sense of Tranquillity is therefore judged to be medium.
- 7.95 Combining judgements about value and susceptibility, the resulting sensitivity of the sense of tranquillity offered by the Site is judged to be medium.

Existing Sense of Openness

- 7.96 The Site contributes to the sense of openness between settlements and also between the urban fringe and M1 motorway.
- 7.97 Although the Kirklees Unitary Development Plan (revised 2007) designated rural land between Chidswell and West Ardsley (including the Site) as Green Belt, this was reviewed as part of the Strategic Housing Land Availability Assessment (SHLAA) 2014, and Employment Land Supply Review (ELSR). The Green Belt designation was consequently removed from the Site when the Local Plan was adopted in February 2019. The revised Green Belt boundary now runs along the eastern and southern boundaries of the Site.
- 7.98 Despite the removal of the Green Belt designation, the Site still contributes to the sense of openness between existing residential areas. The quality of the openness is judged to be good, with the only detracting features being a line of large-scale pylons which run across the Site.
- 7.99 The sense of openness provided by the Site is likely to be valued by residents of properties which currently enjoy relatively uninterrupted views across the Site, and also by some motorists using the local roads such as Batley Road. Although, in landscape assessment terms, the overall value attributed to the Site's sense of openness is diminished by removal of the Green Belt designation, the value of the Site in providing a sense of openness is still judged to be high.
- 7.100 There is little ability to accommodate the Proposed Development without losing the existing sense of openness due to the transformative nature of the Proposed Development. The

susceptibility of the sense of openness to the Proposed Development is therefore considered to be high.

7.101 Combining judgements about value and susceptibility, the resulting sensitivity of the sense of openness offered by the Site is judged to be high.

Table 7.1: Summary of Landscape Character Areas

Landscape Receptor	Susceptibility	Value	Sensitivity
1. NCA 38	Low	Moderate	Medium Low = Medium
2. LCA E8	Medium	Moderate	Medium
3. LCA Northern Coalfield	Low	Moderate	Medium Low = Medium
4. LCM 6	Low	Moderate	Medium Low = Medium
5. LCM8	Low	Moderate	Medium Low = Medium
6. Settlement	Low	Low	Low
7. Topography	Medium	Moderate	Medium
8. Agricultural land	High	Moderate	High Medium = High
9. Hedgerows	Medium	Moderate	Medium
10. Existing trees	Low	High	Medium
11. Watercourses	Medium	High	High Medium = High
12. PROWS	Low	High	Medium
13. Sense of tranquillity	Medium	Moderate	Medium
14. Sense of Openness	High	High	High

Visual Baseline

7.102 Viewpoints were initially identified through the baseline assessment, and in the field each viewpoint was visited and recorded. Not all views identified in the field have been assessed in this LVA. This is due to the following factors:

- i. The Site is not visible within the view due to intervening vegetation and landform;
- ii. The viewpoint is inaccessible due to land ownership; and
- iii. The demonstrable effect from the viewpoint is represented by other viewpoints identified within the vicinity.

7.103 In respect of point i above, the Site and Proposed Development may not be visible in all assessed viewpoints. However, the modelling exercise is undertaken in these instances to determine visual effects from this representative location. A total of 11 representative views within the established ZTV (**Figure 1.7 within appendix 7.1**) have been selected for the analysis of visual effects. The views have been agreed with the Local Planning Authority.

7.104 In order to establish the ZTV i.e. the area within which the development is theoretically visible, the Site is assessed in relation to survey maps. This provisional visual assessment is then refined in the field, at which stage visual receptors are also identified. These include highways and public footpaths, as well as residential properties, work places and Publicly Accessible Open Spaces.

7.105 Key views have been selected at strategic locations around the Site. It is considered 'best practice' to categorise views into 3 ranges depending on the proximity of the viewpoint. The categorisation is based on the scale and nature of the landscape, and is as follows:

Close: less than 250m

Medium: between 250m – 1km

Long: More than 1km

7.106 The Proposed Development occupies a large parcel of land set on a sloping topography with a largely north-easterly aspect. The highest parts of the Site are located in its southern portion, while the lowest points occupy a shallow valley formed by Hey Beck, which runs through central regions of the Site. Open views of the Site are afforded from surrounding residential areas, particularly from those on elevated ground to the north-east. Some visual containment is provided by housing on Heybeck Lane, Leeds Road and Chidswell Lane. Wooded copses, known as Dum Wood and Dogloitch Wood, located just beyond the northern and eastern boundaries of the Site serve to screen lower parts of the Site. Screening is also provided by trees that run along the Site's south-western boundary. Existing hedgerows and hedgerow trees within the Site provide some localised screening of fields. Views from Leeds Road are largely screened by existing houses flanking its western side, though framed views are possible through two gated access points and a PROW. Given the position and extent of the Site, and the scale of the Proposed Development, a study area of 3km radius (taken from the centre of the Site) is considered appropriate for the assessment. Representative views, together with a variety of receptors types which exhibit a range of sensitivities, have been identified. The baseline condition of these representative views is set out in the following tables:

Table 7.2.1 Representative View 1

View 1 – Rear gardens of dwellings on corner of Leeds Road and Heybeck Lane	
Figure Reference	1.10
National Grid Field No.	SE26962440
Elevation	108m AOD
Distance	Close
Direction of view	South-westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Residents of dwellings on the eastern side Leeds Road, and southern side of Heybeck Lane.
Value	Moderate: The views are of attractive countryside, interrupted with a few detracting features
Susceptibility	High
Sensitivity	High
Reason for view selection	The viewpoint is located on the urban fringe, at the threshold between the rural landscape and the residential area to its north and west. The viewpoint is representative of the views experienced from areas to the rear of dwellings on Leeds Road and Heybeck Lane.
Description	• Receptors experience a predominantly rural outlook, composed of medium-sized arable fields set on a rolling topography that dips steadily towards the valley floor to the east, while rising locally to the south. • The rural landscape is bordered by twentieth century development which, in general, creates a conspicuous hard boundary to its north and west. • Other detracting elements include a row of large scale pylons which run along part of the Site's northern-most boundary, near Leeds Road. • The foreground view is somewhat contained by overgrown hedgerows and sizeable tree copses which screen views to the east. • Mid to long-distance views are afforded to the south, due to the rising nature of the ground. Here, a patchwork of rolling arable fields, frequently bounded by overgrown hedgerows, rise to high ground at Gawthorpe reservoir. • Features on the distant southern ridgeline, including the tower at Gawthorpe Reservoir, the spire of Trinity Church Ossett, and housing at Manor Park, form focal points within the view. • Other points of interest include vestiges of the pre-industrial landscape such as the stone-built barns at Lee House Farm.

Table 7.2.2 Representative View 2

View 2 – PROW between Hey Beck Farm and southern side of Dum Wood	
Figure Reference	1.11
National Grid Field No.	SE27442406
Elevation	86m AOD
Distance	Close
Direction of view	South-westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Users of PROW
Value	Moderate: The view is generally attractive with some detracting features, and is typical of the locality. The view is located near the edge of Green Belt designated land (located east of the Site).
Susceptibility	High: People using the PROW who are engaged in outdoor recreation and whose attention or interest is likely to be focussed on the landscape and views
Sensitivity	High
Reason for view selection	The viewpoint represents views experienced from a PROW running from Green Belt designated land, into the Site.
Description	• The viewpoint is located on relatively elevated ground at the eastern boundary of the Site, affording broad views across a predominantly rural landscape set on a rolling topography. • The fields comprising the Site dominate most of the view, taking in short, middle and long-range areas. • Large pylons are visible at very close range, forming conspicuous detracting elements within a predominantly rural landscape. • Some containment of the view is brought about by Dum Wood to the north-west and various overgrown hedgerows to the south-east. • Hedgerows within the Site break-up views of fields in the middle distance though, further south, the land rises to a ridgeline on which detracting features (such as the tower at Gawthorpe Reservoir) are visible. • Houses on Leeds Road and pre-industrial stone-built buildings of Lees House farm are visible in the middle distance to the south-west. • The rural landscape appears to be generally intact, but a little compromised by a number of detracting elements.

Table 7.2.3 Representative View 3

View 3 – Rear gardens of houses on Windsor Oval	
Figure Reference	1.12
National Grid Field No.	SE27912424
Elevation	97m AOD
Distance	Medium
Direction of view	South-westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Residents of dwellings on the southern side of Windsor Oval.
Value	Moderate: View with distinctive features, but relatively typical of the locality
Susceptibility	High: Residents at home
Sensitivity	High
Reason for view selection	The viewpoint is located at housing that sits on elevated ground some distance from the Site, affording panoramic views across the landscape
Description	• From this elevated viewpoint, receptors experience panoramic views of an urban fringe (but predominantly rural) landscape, set on a rolling topography that rises gently to the south-west. The landform is seen to be further incised by local streams which generally run north-west to south-east. • The rural landscape is composed of a patchwork of medium-sized fields (a mixture of arable and pasture), enclosed by overgrown hedgerows with many mature hedgerow trees. • The sizeable copses of Dogloitch Wood and Dum Wood make a significant contribution to the well-wooded character of the view. Dum Wood, in particular, serves to screen a large proportion of residential development on Heybeck Lane and Leeds road. • Modern and historic pre-industrial farmsteads dot the landscape. • Twentieth century housing lines roads (including Heybeck Lane, Leeds Road, and at Manor Park) in peripheral regions of the view. • Other detracting elements within the view include a line of large pylons which traverses the landscape, and the M1 motorway which is located in the distance to the south-east.

Table 7.2.4 Representative View 4

View 4 – Batley Road north	
Figure Reference	1.13
National Grid Field No.	SE28282419
Elevation	99m AOD
Distance	Medium
Direction of view	South-westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Road users on Batley Road
Value	Moderate: View with distinctive features but relatively typical of the locality. Generally attractive with some detracting features
Susceptibility	Low: Road users, where speed of travel and nature of the views involved are short lived and have no special significance
Sensitivity	Medium Low = Medium
Reason for view selection	The viewpoint represents transitory, but fairly prolonged, views of the Site from an elevated position, north-east of the Site.
Description	• From this elevated viewpoint, receptors experience panoramic views of an urban fringe landscape. • Detracting elements within the foreground include lamp columns, a bus stop, pavements, and garden boundaries. Within the middle distance, a line of large pylons traverses the landscape. In the distant south-east, the M1 motorway is also discernible. • Although few in number, pre-industrial remnants - such as the stone-built walls that line the southern side of Batley Road, stone barns of Lee House Farm on the western boundary of the Site, and the spire of Trinity Church Ossett in the distant south – are also in evidence, juxtaposed to twentieth century development. These elements, together with historic field patterns, tree copses, and landform create a view displaying a fairly rich time depth.

Table 7.2.5 Representative View 5

View 5 – Baghill Road (north)	
Figure Reference	1.14
National Grid Field No.	SE27702490
Elevation	110m AOD
Distance	Medium
Direction of view	South-westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Road users on Baghill Road
Value	Moderate: View with distinctive features but relatively typical of the locality. Generally attractive with some detracting features
Susceptibility	Low: Road users, where speed of travel and nature of the views involved are short lived and have no special significance
Sensitivity	Medium Low = Medium
Reason for view selection	The viewpoint represents the view experienced from a local road within a residential area set on relatively high ground north-east of the Site.
Description	- From this elevated viewpoint, receptors experience long-range panoramic views of a heterogenous landscape composed of rolling fields interspersed with woodland and hedgerows, together with remnants of the industrial era, including terraced houses and stone walls. Twentieth century houses lining Hey Beck Lane and Leeds Road are also visible in middle and long-range regions, respectively. These brick built twentieth century houses tend to be less sympathetic to the surrounding landscape than older properties built from local stone. - Other detracting elements within the urban fringe landscape include, street columns, large scale pylons, and water towers. - The distinctive form of Emley Moor mast is also discernible in the distant south.

Table 7.2.6 Representative View 6

View 6 – Park at East Ardsley	
Figure Reference	1.15
National Grid Field No.	SE28722565
Elevation	138m AOD
Distance	Medium
Direction of view	South-westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Park users
Value	Moderate: View with distinctive features but relatively typical of the locality
Susceptibility	Medium: People engaged in outdoor recreation where the enjoyment of the landscape is incidental rather than the main interest
Sensitivity	Medium
Reason for view selection	The viewpoint represents the view experienced from a small local park which has a playground, open areas of lawn, a number of boundary trees, and several paved routes.
Description	• This is the highest viewpoint selected for this study. The viewpoint is located in a small open space within a residential area set on south-facing slopes. Consequently, foreground views are largely composed of the roof tops of nearby houses, and their gardens. • Beyond this, the views are panoramic, and are characterised by an urban fringe landscape that is set on a rolling topography. This landscape is relatively well vegetated with overgrown hedgerows and pockets of woodland. • Long range views take in Emley Moor mast to the south and the tower at Castle Hill to the south-west.

Table 7.2.7 Representative View 7

View 7 – Batley Road (south)	
Figure Reference	1.16
National Grid Field No.	SE 28530 23935
Elevation	99m AOD
Distance	Medium
Direction of view	Westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Road users, potentially occasional pedestrians on footway east of carriageway
Value	Moderate: The view is generally attractive over a landscape of recognised character and quality and relatively typical of the locality.
Susceptibility	Low: Glimpsed view generally experienced by road users travelling towards West Ardsley, or occasional pedestrians, whose attention is less likely to be focussed on the landscape than users of PROWs.
Sensitivity	Medium low = Medium
Reason for view selection	The viewpoint represents the view experienced by motorists travelling towards West Ardsley from Kirkhamgate.
Description	• The view is dominated by large open arable fields with glimpses of the tops of trees and small areas of woodland, set on a gently rolling topography. • Wooded copses and tree-lined streams characterise lower regions of the landscape. • A ridgeline, featuring broken bands of small-scale woodland, interspersed with buildings (including The Huntsman Inn, Windsor Farm, tower at Gawthorpe reservoir and housing at Manor Park) forms the horizon to the west. • One large scale pylons is visible on the horizon on the right hand side of the view. • The Site can be seen to occupy a large proportion of the east-facing slopes that comprise mid to long-range views. The Site boundary runs close to the ridgeline to the west and to housing lining Leeds Road further north.

Table 7.2.8 Representative View 8

View 8 – Gawthorpe Lane, Kirkhamgate	
Figure Reference	1.17
National Grid Field No.	SE29562271
Elevation	78m AOD
Distance	Long
Direction of view	North-westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Users of the bridleway (PROW)
Value	Low: The M1 motorway forms a significant detracting feature within the foreground view. The views are also restricted, with foreground features interrupting the view.
Susceptibility	Medium: Users of public rights of way where enjoyment of the landscape is incidental rather than the main interest.
Sensitivity	Medium Low = Medium
Reason for view selection	The viewpoint represents the view experienced from a PROW that runs between the settlement of Kirkhamgate and countryside to the north-west. The PROW connects to a network of other PROWs which ultimately cross the Site.
Description	- From this elevated viewpoint, receptors experience mid to long-range views towards an urban fringe landscape composed mainly of large fields, set on sloping ground. - Agricultural land is bordered by twentieth century development, including the M1 motorway which forms a detracting element running along the valley bottom (comprising the foreground view), and mixed development along the ridge to the west, including the tower at Gawthorpe Reservoir and housing at Manor Park. - Housing running along Leeds Road breaks the skyline to the north-west, while housing at East Ardsley is also discernible, nestled amongst woodland located midway up sloping ground to the north. - A line of large pylons, running east-west in the middle-distance, forms a detracting feature within the view. - Dogloitch Wood forms a sizeable mid-range feature, screening part of the Site (and the entirety of site A). - Mature hedgerow vegetation screens the southern edge of the Site although the upper western and north-western regions of the Site (located on high ground within the general topography) are visible. These are set against a backdrop of woodland, twentieth century housing at Manor Park and the modern barns of Windsor Farm.

Table 7.2.9 Representative View 9

View 9 – PROW, south of Site	
Figure Reference	1.18
National Grid Field No.	SE27482285
Elevation	112m AOD
Distance	Close
Direction of view	North-westerly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Users of the footpath (PROW)
Value	Moderate: The view has a character and quality which is typical of the locality.
Susceptibility	High: People using PROWs, whose attention or interest is likely to be focussed on the landscape.
Sensitivity	High Medium = High
Reason for view selection	The viewpoint represents the view experienced from a PROW that runs between the residential area of Gawthorpe and the Site. The PROW connects to a point next to the Huntsman Inn on Chidswell Lane.
Description	- The landscape is set on a topography that generally slopes from south-west to north-east. Further away, the landscape rises to the north and north-east. - Foreground and mid-range views are of large, open fields delineated by intermittent hedgerows. - The closest visible copse is Dum Wood, lying next to the Site's Eastern boundary. Dogloitch Wood, which also lies in close proximity to the Site, is not visible from this viewpoint. - The wider landscape generally has an urban fringe character, composed of fields, woodland and housing; existing houses flanking Leeds Road form a very legible, somewhat stark, feature on the Site's distant north-western boundary; housing at Manor Park, near the Site's south-western boundary sits rather incongruously between Windsor Farm and existing woodland; larger settlements are also visible at West Ardsley, east of the Site. Buildings generally date from the Twentieth Century though a number of industrial era and pre-industrial buildings can be discerned. The latter tend to be stone-built, an example being Lees House Farm. - Detracting elements include a line of pylons that traverse a portion of the Site, located in the middle-distance. Other detracting elements include commercial sheds that line the M62 corridor, situated c.1.5km north of the Site.

Table 7.2.10 Representative View 10

View 10 – PROW connecting to Chidswell Lane	
Figure Reference	1.19
National Grid Field No.	SE26762285
Elevation	125m AOD
Distance	Close
Direction of view	North-easterly
Season	Winter
Conditions	Clear
Visibility	Good
Type of Receptor	Users of the footpath (PROW)
Value	Moderate: The view has a character and quality which is typical of the locality
Susceptibility	High: People using PROWs whose attention or interest is likely to be focussed on the landscape
Sensitivity	High Medium = High
Reason for view selection	The elevated viewpoint represents the view experienced from a footpath (PROW) that runs between the Chidswell Lane and Site.
Description	• At this elevated viewpoint, receptors experience long-range views of an urban fringe landscape. Foreground and middle distance views are generally dominated by fields, though longer range views in all directions include development including: residential settlements on land to the north and west; large pylons and telegraph poles which traverse the Site and wider landscape; a large scale installation of photovoltaic cells on low ground beyond Dogloitch Wood; and a water tower at Gawthorpe Reservoir which sits on the same ridgeline as the viewpoint • Though quite open visually, middle and distant views are more contained than the foreground by virtue of greater woodland cover, overgrown hedgerows and the rolling topography. • Foreground views are of large open fields set on a sloping topography that falls away in the direction of Dogloitch wood. Fields are bounded by post and wire fencing or by intermittent hedgerows which create an open, expansive foreground view.

Table 7.2.11 Representative View 11

View 11 – PROW connecting to Leeds Road, on western edge of Site	
Figure Reference	1.20
National Grid Field No.	SE26652354
Elevation	122m AOD
Distance	Close
Direction of view	Easterly
Season	Summer
Conditions	Clear
Visibility	Good
Type of Receptor	Users of the footpath (PROW)
Value	Moderate: The view has a character and quality which is typical of the locality.
Susceptibility	High: People using PROWs whose attention or interest is likely to be focussed on the landscape.
Sensitivity	High Medium = High
Reason for view selection	The viewpoint represents the view experienced from a footpath (PROW) located on high ground within the Site. The footpath runs between Leeds Road and the south-western corner of the Site. It joins the broader PROW network within the Site and ultimately connects to the wider rural fringe landscape and surrounding residential areas.
Description	• From this elevated viewpoint, long-range views to the north-east are afforded. • The middle distance is generally located on low ground which is out of sight by virtue of the topography. However, a line of trees on high ground to the south-east is visible, and this line of vegetation helps to visually contain the view. • Nearby hedgerows and woodland visually contain the angle of the foreground view, which is otherwise characterised by large open fields. The plateauing nature of the topography on which this field sits makes it a very prominent component of the wider view. • Beyond the foreground, the landscape is composed of medium to large fields with hedgerows and woodland copses, set on a rolling topography. The broader landscape displays significant influences from the twentieth century, including extensive residential settlements, large pylons and a field of photovoltaic cells.

Identification and Evaluation of Likely Significant Effects

7.107 This section of the chapter assesses the effects on existing landscape character and fabric – both short and long term, which will depend on the scale of the Proposed Development, and the value and significance of the wider landscape.

Effects on Landscape Character

Effects on National Character Area

7.108 The change brought about by the Proposed Development would be at Site level, and would be of a nature and scale that is generally consistent with the defining characteristics of the NCA. The *magnitude of change* that the Proposed Development would exert on the NCA is therefore judged to be negligible.

7.109 Since the sensitivity of the baseline NCA is judged to be medium low, and the magnitude of change brought about by the Proposed Development is judged to be negligible, the resulting *effect* on the NCA is assessed as **negligible**, and permanent.

Effects on Local Character Area

Effects on LCA E8: Batley-Dewsbury Rural Fringes

7.110 The Proposed Development would create a new settlement within the unit of LCA E8: Batley-Dewsbury Rural Fringes that lies north-east of Dewsbury. The Proposed Development would transform almost half of this unit of the LCA that currently exists in this region of the district, leaving only landlocked remnants to the west of Leeds Road, and a narrow parcel south-west of Batley Road.

7.111 Existing topography would remain relatively intact, as would existing hedgerows and woodland copses, since the Proposed Development seeks to incorporate these existing landscape assets into its Green Infrastructure proposals. However, a large proportion of the agricultural land which currently contributes to the LCA's open character would be lost, substantially altering a key characteristic of the baseline LCA.

7.112 Views from high ground located immediately south-west of Batley Road would be transformed due to the elevated nature of the ground, together with the extensive, transformative nature of the Proposed Development. However, views from regions of the LCA west of Leeds Road, would be largely unaffected due to the screening effects of properties lining Leeds Road, combined with natural topography.

7.113 Green Belt land within the LCA sits outside the Site boundary, so will not be directly affected by the Proposed Development.

7.114 Considering the LCA as a whole, the Proposed Development would bring about substantial alteration to key characteristics of the baseline, and would impose totally different aesthetic and perceptual qualities on the Site due to its large physical scale. The *magnitude of change* that the Proposed Development would exert on this unit of the LCA is judged to be high.

7.115 Since the sensitivity of the baseline LCA is judged to be medium, and the magnitude of change brought about by the Proposed Development is judged to be high, the resulting *effect* on this unit of the LCA is assessed as **moderate-major adverse**, and permanent.

Effects on LCA Northern Coal Field

- 7.116 Land in the north-western reaches of the LCA form an area of rural/urban fringe landscape, which is also designated Green Belt. Since the Site abuts this boundary, without extending into it, it is envisaged that change to the LCA will be limited to issues relating to perceptions of openness, sense of tranquillity, and visual amenity. These perceptions are likely to be experienced, in the main, by people using PROWs which run between the LCA and the Site. There is very limited visibility from surrounding dwellings, Publicly Accessible Open Spaces and roads within the LCA.
- 7.117 Considering the LCA as a whole, effects generated by the Proposed Development are likely to be localised, diminishing with distance from the LCA's northern-western boundary. This is due, in part, to the layout of the Proposed Development, which places taller commercial buildings on relatively low ground within the Site, while smaller residential buildings occupy more visible peripheral areas.
- 7.118 Limited, localised changes beyond the boundary of this large LCA would introduce only a very minor difference in aesthetic and perceptual quality from within the LCA. Moreover, the Proposed Development would be consistent with baseline conditions in which modern residential settlements are visible in all directions beyond the openness of the rural landscape. The magnitude of change to the LCA as a whole is therefore judged to be negligible.
- 7.119 Since the sensitivity of the baseline LCA is judged to be medium low, and the magnitude of change brought about by the Proposed Development is judged to be negligible, the resulting *effect* on the LCA is assessed as **negligible**, and permanent.

Effects on LCA Arable Fringe Farmland (including Landscape Units LCM6 East Ardsley Fringe, and LCM8 South Morley Fringe)

- 7.120 The LCA occupies relatively high ground east of the Site, including the eastern slopes of the shallow valley that rises up from Hey Beck. The LCA shares some inter-visibility with the Site, but their respective boundaries do not meet, being separated by c.360m at their nearest point. Changes to the LCA would therefore be limited to visual and perceptual changes, which are likely to be experienced by users of PROWs (including the Leeds Country Way), and a few locations on Batley Road.
- 7.121 The Proposed Development is consistent with some of the defining features of the urban fringe LCA, including the fragmentation of existing farmland and the corresponding increase in settlement. This would be exacerbated by the Proposed Development, and is likely to affect perceptions of openness, although it will not directly compromise the characteristics of the LCA's Green Belt designation.
- 7.122 In order to minimise adverse effects on surrounding receptors including adjacent LCAs comprising the Arable Fringe Farmland, the principles underpinning the parameter plans have been carefully considered, to the extent that commercial buildings are located on low ground between existing tree copses (which provide a high degree of screening) while dwellings, which generate a finer urban grain, occupy more visible higher ground. The Development Area & Use parameter plan (reference 00-201) includes a school building on high ground in the western-most corner of the Site, but with a lower building height than surrounding residential units.
- 7.123 Considering the full extent of the LCA, the Proposed Development would bring about a very minor alteration to baseline conditions. Changes would be limited to those affecting views from the LCA, but it is judged that these would not be uncharacteristic of those already experienced in different areas of this arable fringe LCA. The resulting magnitude of change is judged to be **negligible**.

- 7.124 Since the sensitivity of the baseline LCA is judged to be low, and the magnitude of change brought about by the Proposed Development is judged to be negligible, the resulting *effect* on the LCA is assessed as **negligible**, and permanent.

Effects on Landscape Fabric

Effects on Settlement

- 7.125 The Proposed Development would transform existing agricultural land, replacing it with a mixture of residential development and commercial buildings. Commercial development would be located in the lower, central regions of the Site, which would help buffer associated large commercial buildings from existing residential areas; to the north-east and south the buffer would be provided by existing agricultural land, while to the south-west the buffer would be provided by proposed residential development. The Proposed Development as a whole would extend considerably the north-eastern edge of Dewsbury, though 'satellite' residential areas such as West Ardsley would retain their 'separateness' by virtue of the buffer of agricultural land north-east of the Site. Retention of agricultural land, east and south of the Site would further contain the urban extension of Dewsbury.
- 7.126 The *magnitude of change* to settlement pattern is judged to be **medium**, since the Proposed Development would introduce elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape.
- 7.127 Taking sensitivity and magnitude of change into consideration, the *effect* on settlement is assessed as **minor-moderate adverse**, and permanent.

Effects on Topography

- 7.128 The Proposed Development is largely sympathetic to the natural topography of the Site. Dwellings are likely to have relatively small building footprints, set to existing levels. Larger structures, particularly the commercial buildings, require horizontal platforms of corresponding size. This is likely to require the modification of existing levels. Most of these changes will occur in central regions of the Site, which generally lie on relatively low ground within the landscape.
- 7.129 The localised changes caused by the large commercial buildings are judged to be high due to the widespread alteration they would cause to the baseline topography. These changes would be large in scale though limited to the building footprint and its immediate curtilage. Other regions of the Site, which would mainly be composed of houses, gardens, Publicly Accessible Open Space and roads, would experience a negligible change to baseline topography. Considering the Site as a whole, and recognising that changes to topography will be concentrated in the lowest reaches of the Site, the overall magnitude is judged to be medium.
- 7.130 On balance, the *effect* of the Proposed Development on topography is assessed as **moderate adverse**, and permanent.

Effects on Agricultural Land

- 7.131 The Proposed Development will completely transform the agricultural landscape. Proposed Parameter Plan – Development Area and Use (ref. 00-201) indicates that all existing fields will be removed from cultivation, and replaced by development. Proposed Parameter Plan – Green Infrastructure (ref. 00-204) shows that the only features of the agricultural landscape to be conserved would be the hedgerows (including a number of mature trees) that currently delineate fields. The intervention would be large in scale and would impose a totally different aesthetic and perceptual quality on the Site, compared to baseline conditions. The *magnitude of change* is judged to be high.

7.132 The *effect* of the Proposed Development on the agricultural land is assessed as **major adverse**, and permanent.

Effects on Hedgerows

7.133 As shown on the Green Infrastructure parameter plan (ref. 00-204), existing hedgerows are generally to be retained across the Site and incorporated into proposals for Publicly Accessible Open Space. However, some short stretches of hedgerow may be removed where they have the potential to conflict with commercial buildings in the lower parts of the Site, and localised points on the proposed Primary Link Road and other roads within proposed residential areas. The change brought about by these interventions would be localised and operate at the level of the immediate landscape setting of the Site. The magnitude of change brought about by the Proposed Development is therefore judged to be low.

7.134 The effect of the Proposed Development on hedgerows is assessed as **minor-moderate adverse**, and permanent.

Effects on Trees

7.135 Proposed Parameter Plans – Green Infrastructure and Development Area show that existing trees can be retained. However, a limited number of trees, including some with TPO's, fall within the area of employment use shown on Proposed Parameter Plan – Development Area and Use, and at localised points on the spine road corridors shown on Proposed Parameter Plan – Access. However, this represents a small loss to the baseline. The *magnitude of change* brought about by the loss of a limited number of trees is judged to be low.

7.136 The effect of the Proposed Development on trees is assessed as **minor-moderate adverse**, and permanent.

Effects on Watercourses

7.137 Existing watercourses are to be conserved, and used as part of the Site-wide-wide SUDS strategy. The rates at which surface water run-off is discharged into existing water courses is likely to increase, though these would be carefully controlled, and additional balancing ponds would be used to meet the inevitable increase in run-off volume. The magnitude of change to existing watercourses is judged to be low.

7.138 The *effect* of the Proposed Development on watercourses is assessed as **moderate adverse**, and permanent.

Effects on PROWs

7.139 The illustrative masterplan, which is underpinned by the parameter plans, shows how the Proposed Development could incorporate all existing PROWs and how the proposal could create additional routes through the site. The setting of these PROWs would change markedly, resulting in a loss or alteration to the baseline condition of these routes. The *magnitude of change* to PROWs is therefore judged to be medium.

7.140 The *effect* of the Proposed Development on PROWS is assessed as **moderate-major adverse**, and permanent.

Effects on the Sense of Tranquillity

7.141 The Proposed Development, together with associated activity and noise, will have a transformative effect, imposing totally different aesthetic and perceptual qualities on the Site versus those generated by baseline conditions. The *magnitude of change* to the sense of tranquillity is judged to be high.

7.142 The effect of the Proposed Development on the sense of tranquillity is therefore assessed as **moderate-major adverse**, and permanent.

Effects on the Sense of Openness

7.143 The Proposed Development will have a transformative effect on the existing green field Site. Proposed built form - composed of dwellings, primary school, community hub and large-scale commercial buildings - will replace agricultural land. The Proposed Development will extend built form from Chidswell, in the direction of East & West Ardsley. The remaining Green Belt land, lying immediately beyond the Site's eastern boundary, will prevent complete coalescence of these settlements. The *magnitude of change* to the sense of openness is judged to be high.

7.144 Combining judgements on sensitivity with magnitude of change, the *effect* of the Proposed Development on the sense of openness is assessed as **major adverse**, and permanent.

Summary of Landscape Effects

Table 7.3 Summary of Landscape Effects

Character Area		Sensitivity of Landscape Receptor	Magnitude of change	Landscape Effects and nature <u>without</u> Mitigation
1	NCA 38	Medium	Negligible	Negligible
2	LCA E8	Medium	High	Moderate-Major Adverse
3	LCA Northern Coalfield	Medium	Negligible	Negligible
4	LCM 6	Medium	Negligible	Negligible
5	LCM 8	Medium	Negligible	Negligible
6	Settlement	Low	Medium	Minor-Moderate Adverse
7	Topography	Medium	Medium	Moderate Adverse
8	Agricultural Land	High	High	Major Adverse
9	Hedgerows	Medium	Low	Minor-Moderate Adverse
10	Existing Trees	Medium	Low	Minor-Moderate Adverse
11	Water Courses	High	Low	Moderate Adverse
12	PROWS	Medium	Medium	Moderate adverse
13	Sense of Tranquillity	Medium	High	Moderate-Major Adverse
14	Sense of Openness	High	High	Major Adverse

Effects on Visual Amenity

- 7.145 A comprehensive visual assessment has been undertaken to determine the degree of visual effect the Proposed Development would have upon the surrounding landscape.
- 7.146 For all views a computer-generated block model, illustrating the typical form, massing and height of the Proposed Development was created and set within photographs of representative viewpoints. These models are based on the Proposed Parameter Plans – Development Area and Use, and Maximum Building Height provided by the architect.

Table 7.4.1 Assessment of Visual Effects on View 1

View 1 – Rear gardens of dwellings on Corner of Leeds Road and Heybeck Lane	
Figure Reference	1.10
Distance	Medium
Direction of view	South-westerly
Type of Receptor	Residents of dwellings on the eastern side Leeds Road, and southern side of Heybeck Lane
Sensitivity	High
Proposed view	• There would be no change to the short-range view as the Proposed Development would not extend into the field running adjacent to the houses on Hey Beck Lane and the more northerly reaches of Leeds Road. • However, medium and long-range views to the south (extending from the nearest pylon to the tower at Gawthorpe reservoir) would be transformed as existing fields would be completely replaced by built form. Medium-range views would be dominated by large commercial buildings. On the more distant high ground to the south, views would be of proposed houses, community hub and school. • Dum Wood and on-site retained hedgerow vegetation (including mature trees) would screen a large proportion of the Proposed Development located south-east of the viewpoint.
Magnitude of change	Medium: The Proposed Development would partially occupy a partial proportion of the view and would likely be noticed by the observer. The angle of the view and distance from the Proposed Development would result in a perceivable change to the existing view that will change the character or quality of the view.
Predicted visual effects	Moderate-major adverse, and permanent

Table 7.4.2 Assessment of Visual Effects on View 2

View 2 – PROW between Hey Beck Farm and southern side of Dum Wood	
Figure Reference	1.11
Distance	Close
Direction of view	South-westerly
Type of Receptor	Users of PROW
Sensitivity	High
Proposed view	• Short-range views would be transformed by proposed large-scale commercial buildings. • These tall structures would also screen much of the mid to long-range view to the south though occasional, glimpsed views of the distance ridgeline would be possible via gaps between buildings.
Magnitude of change	High
Predicted visual effects	Major adverse, and permanent

Table 7.4.3 Assessment of Visual Effects on View 3

View 3 – Rear gardens of houses on Windsor Oval	
Figure Reference	1.12
Distance	Medium
Direction of view	South-westerly
Type of Receptor	Residents of dwellings on the southern side of Windsor Oval
Sensitivity	High
Proposed view	• Short-range views would be unaffected because the region between the Site's eastern boundary and the viewpoint is protected by a Green Belt designation. • However, the Proposed Development would transform the middle and far regions of the view. Large commercial buildings would span the landscape between Dum Wood and Dogloitch Wood, transforming the view from right to left, while the proposed residential areas would add depth to this by extending built form up to the ridgeline to the south-west. • The Proposed Development would reduce considerably the rural fringe character and openness of the view, though the Site would still be read within this context as existing offsite fields to the east and south would remain undeveloped, as would Dum Wood and Dogloitch Wood. • The Proposed Development would occupy a large/extensive proportion of the view and would be easily noticed by the observer.
Magnitude of change	High
Predicted visual effects	Major adverse, and permanent

Table 7.4.4 Assessment of Visual Effects on View 4

View 4 – Batley Road north	
Figure Reference	1.13
Distance	Medium
Direction of view	South-westerly
Type of Receptor	Road users on Batley Road
Sensitivity	Medium
Proposed view	• Short-range views of fields east of Hey Beck would be unaffected because the region between the Site's eastern boundary and the viewpoint is protected by a Green Belt designation. • However, much of the visible landscape west of Hey Beck, and extending to the ridgeline to the south-west, would be transformed by the Proposed Development. Commercial buildings would be highly visible though their location, within the lower reaches of the valley, would reduce their overall visual impact. Proposed houses located on ground rising to the ridgeline to the south-west, and extending in a north-westerly direction to Leeds Road, would also be visible. • The Proposed Development would occupy a large and extensive proportion of the view and would be easily noticed by the observer.
Magnitude of change	High
Predicted visual effects	Moderate-Major adverse, and permanent

Table 7.4.5 Assessment of Visual Effects on View 5

View 5 – Baghill Road (north)	
Figure Reference	1.14
Distance	Medium
Direction of view	South-westerly
Type of Receptor	Road users on Baghill Road
Sensitivity	Medium
Proposed view	• From this elevated viewpoint, proposed commercial buildings would be seen to extend up from the valley bottom, with their eastern-most extent sitting between Dum Wood and Dogloitch Wood. • Deeper within the Site, on ground that ascends to the ridgeline to the south-west, proposed houses would be visible, as would the proposed community hub and school. • Dum Wood would provide a high degree of screening to commercial buildings located immediate to its south-east, though large commercial buildings proposed on higher ground beyond would be visible over tree canopies. • Dogloitch Wood would only screen a small proportion of the total number of houses proposed in the south-eastern reaches of the Site. • The Proposed Development would represent a substantial alteration to the baseline view.
Magnitude of change	Medium
Predicted visual effects	Moderate adverse, and permanent

Table 7.4.6 Assessment of Visual Effects on View 6

View 6 –Park at East Ardsley	
Figure Reference	1.15
Distance	Medium
Direction of view	South-westerly
Type of Receptor	Park users
Sensitivity	Medium
Proposed view	• The large commercial buildings proposed in the lower reaches of the Site would be visible though foreground vegetation close to the viewpoint, and woodland close the Site, would screen large buildings close to the Site's eastern boundary. • Proposed houses occupying ground that rises to the ridgeline to the south-west, along with the proposed community hub and school which also sit on high ground within the Site, would be visible from this elevated, distant viewpoint. • Distant views in the direction of Emley Moor and regions to its east and west, would not be obscured by proposed built form. • The Proposed Development would occupy a partial proportion of the view and would likely be noticed by the observer. The distance from the Proposed Development would result in a perceivable change to the existing view that will change the character and quality of the view.
Magnitude of change	Medium
Predicted visual effects	Moderate adverse, and permanent

Table 7.4.7 Assessment of Visual Effects on View 7

View 7 – Batley Road (south)	
Figure Reference	1.16
Distance	Long
Direction of view	North-westerly
Type of Receptor	Road users
Sensitivity	Medium
Proposed view	• The foreground view would remain unchanged at it is some distance from the Site boundary, and is covered by a Green Belt designation. • The large commercial buildings proposed in the lower reaches of the valley would be visible in regions between Dogloitch Wood and Dum Wood. These buildings would screen many of the houses proposed in the lower parts of the Site, save for those to the south of Dogloitch Wood. • Proposed houses occupying mid and high elevations would span the view. Within this context, the proposed community hub and primary school would form discrete, conspicuous features on high ground in the south-western corner of the Site. • The Proposed Development would occupy a partial proportion of the view and would likely be noticed by the observer. The distance from the Proposed Development would result in a perceivable change to the existing view that will change the character and quality of the view.
Magnitude of change	Medium
Predicted visual effects	Moderate adverse, and permanent

Table 7.4.8 Assessment of Visual Effects on View 8

View 8 – Gawthorpe Lane, Kirkhamgate	
Figure Reference	1.17
Distance	Long
Direction of view	North-westerly
Type of Receptor	Users of the bridleway (PROW)
Sensitivity	Medium
Proposed view	• The foreground view would remain unchanged at it is some distance from the Site boundary and is covered by a Green Belt designation. • Large-scale buildings comprising the western edge of the proposed commercial area would be visible in the distance, though Dogloitch Wood would screen buildings within its central and eastern regions. • Proposed houses would be seen to extend from the proposed commercial area to the existing tower at Gawthorpe Reservoir, located on the ridgeline. • Deeper within the Site, the proposed community hub and primary school would form discrete, conspicuous features on high ground in the south-western corner of the Site. The profiles of buildings would cut the skyline. • The Proposed Development would occupy a partial proportion of the view and would likely be noticed by the observer.
Magnitude of change	Medium
Predicted visual effects	Moderate adverse, and permanent

Table 7.4.9 Assessment of Visual Effects on View 9

View 9 – PROW, south of Site	
Figure Reference	1.18
Distance	Close
Direction of view	North-westerly
Type of Receptor	Users of the footpath (PROW)
Sensitivity	High
Proposed view	• Large-scale commercial buildings would be visible in the valley bottom. These structures would also screen views of Dum Wood. • Proposed houses would extend from the valley floor to the existing tower at Gawthorpe Reservoir, located on the ridgeline. • On high ground near south-western corner of the Site, the proposed community hub and primary school would form discrete, conspicuous features. • The Proposed Development would occupy a large and extensive proportion of the view and would be easily noticed by the observer.
Magnitude of change	High
Predicted visual effects	Major adverse, and permanent

Table 7.4.10 Assessment of Visual Effects on View 10

View 10 – PROW connecting to Chidswell Lane	
Figure Reference	1.19
Distance	Close
Direction of view	North-westerly
Type of Receptor	Users of the footpath (PROW)
Sensitivity	High
Proposed view	• The view would be considerably foreshortened by proposed houses which would dominate the foreground view. These would screen many of the houses deeper within the Site, and would also obscure views of the proposed commercial buildings in the lower reaches of the Site. • The proposed access road which joins Chidswell Lane would be seen in the corner of the view. • The Proposed Development would be transformative. It would occupy a large and extensive proportion of the view and would be easily noticed by the observer.
Magnitude of change	High
Predicted visual effects	Major adverse, and permanent

Table 7.4.11 Assessment of Visual Effects on View 11

View 11 – PROW connecting to Leeds Road, on western edge of Site	
Figure Reference	1.20
Distance	Close
Direction of view	North-easterly
Type of Receptor	Users of the footpath (PROW)
Sensitivity	High
Proposed view	• The foreground view would be composed of the school grounds which would be visually quite open. The proposed school building and neighbouring houses would, however, limit views to the north-east and east respectively. • The proposed access road which joins Chidswell Lane would be seen in the corner of the view. • The Proposed Development would be transformative. It would occupy a large and extensive proportion of the view and would be easily noticed by the observer.
Magnitude of change	High
Predicted visual effects	Major adverse, and permanent

Table 7.5. Summary of Visual Effects

View	Proximity	Sensitivity of Visual Receptor	Magnitude of Change	Visual Effect and nature <u>without</u> Mitigation
1	Medium	High	Medium	Moderate-Major Adverse
2	Close	High	High	Major Adverse
3	Medium	High	High	Major Adverse
4	Medium	Medium	High	Moderate-Major Adverse
5	Medium	Medium	Medium	Moderate Adverse
6	Medium	Medium	Medium	Moderate Adverse
7	Long	Medium	Medium	Moderate Adverse
8	Long	Medium	Medium	Moderate Adverse
9	Close	High	High	Major Adverse
10	Close	High	High	Major Adverse
11	Close	High	High	Major Adverse

Residual Effects

Mitigation Effects on Landscape Character

7.147 The assessment of residual effects has been based on the Proposed Parameter Plan – Green Infrastructure prepared by Enjoy Design, and the trees within the areas marked for residential, or residential/residential institution use on the Proposed Parameter Plan – Development Area and Use.

Mitigation of Effects on NCA 38, LCA Northern Coal Field, LCA Arable Fringe Farmland (Landscape Units LCM6 and LCM8)

7.148 The landscape effect of the Proposed Development is negligible, so the mitigated Proposed Development would also be negligible.

Mitigation of Effects on LCA E8: Batley-Dewsbury Rural Fringes

7.149 The LCA's role as a setting for development would be significantly diminished due to the loss of an extensive tract of rural fringe land. However, proposals to retain existing water courses, hedgerows and woodland copses, together with additional tree planting, hedgerow laying/gapping up and creation of publicly accessible open space incorporating SuDs features, would serve to mitigate these adverse effects by strengthening valued features of the rural fringe LCA. This extensive Green Infrastructure network would extend across the Site, serving to provide an attractive, naturalistic setting for proposed built form and helping to integrate the Proposed Development into the receiving LCA. However, given the transformative nature of the Proposed Development, the magnitude of change - even with mitigation - is judged to remain high.

7.150 On balance, the effect of mitigated Proposed Development, on the LCA, is assessed as **moderate major adverse**.

Mitigation of Effect on Landscape Fabric

Mitigation of Effects on Settlement

7.151 Mitigation measures included on Proposed Parameter Plan – Green Infrastructure include retaining most existing hedgerows and trees, and creating generous, interconnected green corridors that span the Site. This extensive green network, which would run around and within the Site, would serve to break up built form, helping to integrate it into the existing settlement pattern, as well as adjacent agricultural land. Though these mitigation measures would certainly benefit the Site, they would not substantially change the effect on existing settlement pattern, which is generated largely by the scale and extent of the Proposed Development shown on Proposed Parameter Plan – Development Area and Use. The magnitude of change, with mitigation, would therefore remain medium since the Proposed Parameter Plans for the Proposed Development show that elements would be introduced that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape.

7.152 The resulting effect of the mitigated Proposed Development is therefore assessed as **minor-moderate, adverse**.

Mitigation of Effects on Topography

7.153 Proposed Parameter Plan – Maximum Building Heights shows that the tallest commercial buildings will be located in the lowest parts of the Site. Additional mitigation proposals that could be included in reserved matters applications for Proposed Development would include: limiting the extent of the proposed building platforms to the immediate curtilage of each building; and modelling proposed ground so that it is sympathetic to existing levels without appearing overly engineered. Taking the whole Site into consideration, which includes the proposed residential areas, school and community hub, the perceived magnitude of change with mitigation is judged to be low.

7.154 The effect of the Proposed Development, with mitigation, on the baseline topography is assessed as **minor-moderate adverse**.

Mitigation of Effects on Agricultural Land

7.155 Proposed Parameter Plan – Green Infrastructure shows the retention of hedgerow trees and most hedgerows. Further mitigation of the effects of Proposed Development could be included in landscape proposals at the reserved matters stage. This might include the enhancement of existing retained hedgerows and mature trees through positive management and gapping up. These mitigation measures would have a very limited effect on the widespread loss of agricultural land. The magnitude of change brought about by the Proposed Development, with mitigation, would remain high.

7.156 The effect of the Proposed Development (with mitigation) on agricultural land is assessed as **major adverse**.

Mitigation of Effects on Hedgerows

7.157 The Proposed Parameter Plans show the retention of most existing hedgerows, and their inclusion in proposed landscaped corridors and green buffers. Further mitigation measures, as discussed in paragraph 7.148 could be included in reserved matters submissions, and would include gapping-up with suitable native species and brought into positive management. Such measures would help improve hedgerow biodiversity and habitat value, while also increasing the contribution such features make to visual amenity and screening. These aspects would be further enhanced by connecting existing hedgerows to wider green infrastructure proposals (hedges, trees, shrubs and grassland). Such interventions would help minimise discernible differences in the aesthetic and perceptual qualities of the hedgerows within the proposed Site, versus baseline conditions. These interventions would improve the structure and quality of

existing hedgerows. Should these additional measures, that enhance the base proposals shown on Proposed Parameter Plan – Green Infrastructure, be incorporated at the reserved matter stage, the magnitude of change brought about by the Proposed Development with mitigation would be judged to be low.

7.158 The effect of the Proposed Development (with mitigation) on hedgerows is assessed as **Minor beneficial**.

Mitigation of Effects on Trees

7.159 Proposed Parameter Plan- Development Area and Use and Proposed Parameter Plan – Access show that some trees would be lost as a result of the Proposed Development. This loss could be mitigated through landscape proposals brought forward at reserved matters. Loss of trees would be compensated for through extensive tree planting throughout the Site. Belts of native trees are proposed within the Green Buffer running east-west through central regions of the Site, and other proposed green links, SUDs areas, and publicly accessible open space. Roads, including primary and secondary streets, are also to be planted with trees. These proposals, if incorporated at reserved matters stage would represent an overall betterment to the level of tree cover across the Site. As such, the magnitude of change, with the above mitigation, is judged to be medium.

7.160 The mitigated effect of the Proposed Development on trees is assessed as **moderate, beneficial**.

Mitigation of Effects on Watercourses

7.161 Proposed Parameter Plans show no proposals over existing water courses, and the creation of additional areas for SUDs. More detailed landscape proposals included in any reserved matters applications would be bring existing watercourses into positive management, ensuring that they contribute to the Site-wide SUDs strategy. Additional planting to watercourses would help improve their wildlife and amenity functions, generating synergies between blue and green infrastructure. The magnitude of change to existing watercourses, with mitigation, is judged to be low, and beneficial.

7.162 The mitigated effect of the Proposed Development on watercourses is assessed as **minor-moderate, beneficial**.

Mitigation of Effects on PROWS

7.163 Proposed Parameter Plans – Development Area and Green Infrastructure indicate that it is likely that users of public rights of way will experience a less rural, open view than they do currently. In order to mitigate this, Development Proposals brought forward at reserved matters stage would bring the PROWs into active management, and landscape proposals would seek to protect the existing amenity to the extent practicable. Proposals would also connect the existing network to additional proposed routes, increasing connectivity across the Site. The magnitude of change to existing PROWS, with these mitigation measures, would be low, balancing some adverse and some beneficial elements.

7.164 The mitigated effect of the Proposed Development on PROWs is assessed as **minor to moderate adverse**.

Mitigation of Effects on the Sense of Tranquillity

7.165 Proposed Parameter Plan – Green Infrastructure includes corridors and buffers of landscape, as well as retained tree belts. More detailed proposals brought forward at the reserved matters stage would include a network of public spaces, set within a broader blue and green infrastructure framework. This framework would respond to, and would generate, varying degrees of activity. Some areas of publicly accessible open space would be used intensively, while others would be for quieter use. Though relatively tranquil in the general context of the

Proposed Development, proposed quiet areas would be less tranquil than baseline conditions. The resulting magnitude of change, with mitigation, to the sense of tranquillity is judged to be medium.

7.166 The mitigated effect of the Proposed Development on the sense of tranquillity is assessed as **moderate-major adverse**.

Mitigation of Effects on the Sense of Openness

7.167 Despite incorporating a high degree of built form, the Proposed Development also includes an extensive green infrastructure network, which seeks to link existing site assets - such as woodland and hedgerows - with new, generously planted areas across the Site. This will help to visually break up built form, reducing to a degree, perceived loss of openness. In addition, the largest buildings comprising the commercial component of the Proposed Development would be located in the lowest reaches of the Site in order to minimise a sense of loss of openness. Taking the above mitigation measures into consideration, the magnitude of change caused by the Proposed Development on the sense of openness is still judged to be high.

7.168 The mitigated effect of the Proposed Development on the sense of openness is assessed as **major adverse**.

Summary of Landscape Effects Following Mitigation

Table 7.6. Summary of Landscape Effects following mitigation

Character Area		Sensitivity of Landscape Receptor	Magnitude of change	Landscape Effects and nature <u>without</u> Mitigation	Magnitude of change with mitigation	Landscape Effect and nature with mitigation (residual effect)
1	NCA 38	Medium	Negligible	Negligible	Negligible	Negligible
2	LCA E8	Medium	High	Moderate-Major Adverse	High	Moderate-Major Adverse
3	LCA Northern Coalfield	Medium	Negligible	Negligible	Negligible	Negligible
4	LCM 6	Medium	Negligible	Negligible	Negligible	Negligible
5	LCM 8	Medium	Negligible	Negligible	Negligible	Negligible
6	Settlement	Low	Medium	Minor-Moderate Adverse	Medium	Minor-Moderate Adverse
7	Topography	Medium	Medium	Moderate Adverse	Low	Moderate Adverse

8	Agricultural Land	High	High	Major Adverse	High	Major Adverse
9	Hedgerows	Medium	Low	Minor Adverse	Low	Minor Beneficial
10	Existing Trees	Medium	Low	Minor-Moderate Adverse	Medium	Moderate Beneficial
11	Water Courses	High	Low	Moderate Adverse	Low	Moderate Beneficial
12	PROWS	Medium	Medium	Moderate Adverse	Low	Minor-Moderate Adverse
13	Sense of Tranquillity	Medium	High	Major Adverse	Medium	Moderate-Major Adverse
14	Sense of Openness	High	High	Major Adverse	High	Major Adverse

Mitigated Effects on Visual Amenity

7.169 The details of planting shown on the Parameter Plans will need to be developed through a landscape planting strategy accompanying future reserved matters submissions.

7.170 All views are shown with and without landscape mitigation. Mitigation is shown at 15 years from the development being built.

Table 7.7.1 Mitigated Visual Effect on View 1

View 1 – Rear gardens of dwellings on Corner of Leeds Road and Heybeck Lane	
Figure Reference	1.10
Type of Receptor	Residents of dwellings on the eastern side Leeds Road, and southern side of Heybeck Lane
Predicted visual effects <u>without</u> mitigation	Moderate-Major adverse, and permanent
Proposed view with landscape mitigation	- Green corridors shown on the Proposed Parameter Plans would not affect the proposed view. Landscape proposals brought forward through future reserved matters applications could mitigate changes to the view as follows: - Existing hedgerow vegetation, including mature trees, would be gapped-up and positively managed in order to improve its screening function. - Proposed tree planting to streets and within proposed Publicly Accessible Open Space would help to visually break-up and soften proposed buildings across the Site. - However, the northern elevations of the large commercial buildings, proposed in the middle distance, would remain visually prominent from this viewpoint given the height, scale and contrasting nature of these structures. - Mitigation measures would therefore bring about some, but fairly limited, benefits.
Magnitude of change with landscape mitigation in place	Medium
Predicted visual effects with landscape mitigation in place (residual effect)	Moderate-Major adverse, and permanent

Table 7.7.2 Mitigated Visual Effect on View 2

View 2 – Rear gardens of dwellings on Corner of Leeds Road and Heybeck Lane	
Figure Reference	1.11
Type of Receptor	Users of PROW
Predicted visual effects without mitigation	Major adverse, and permanent
Proposed view with landscape mitigation	- Green corridors shown on the Proposed Parameter Plans would not affect the proposed view. Landscape proposals brought forward through future reserved matters applications could mitigate changes to the view as follows: - Proposed tree planting on one side of the PROW, as well as to proposed Publicly Accessible Open Spaces and to nearby streets, would help to visually soften proposed commercial buildings. - Existing hedgerow vegetation, including mature trees, would be gapped-up and positively managed in order to strengthen the landscape framework within which the proposed commercial buildings would be set. - Taking the above into consideration, the proposed mitigation measures would bring about some necessary benefits but their impact would be limited due to the size and scale of the commercial buildings, together with their close proximity to visual receptors at this viewpoint. The Proposed Development would continue to occupy a large and extensive proportion of the view and would be easily noticed by the observer.
Magnitude of change with landscape mitigation in place	High
Predicted visual effects with landscape mitigation in place (residual effect)	Major adverse, and permanent

Table 7.7.3 Mitigated Visual Effect on View 3

View 3 – Rear gardens of houses on Windsor Oval	
Figure Reference	1.12
Type of Receptor	Residents of dwellings on the southern side of Windsor Oval
Predicted visual effects without mitigation	Major adverse, and permanent
Proposed view with landscape mitigation	- Proposed Parameter Plan – Green Infrastructure shows a 15m wide tree belt on the eastern boundary of the Site. This would screen to a large extent the area of Employment Use shown on Proposed Parameter Plan – Development Area and Use, and Proposed Parameter Plan - Maximum Building Heights. This tree belt would effectively join Dogloitch Wood to Dum Wood, creating an extensive woodland belt that spans middle regions of the view. Landscape proposals brought forward through future reserved matters applications could further mitigate changes to the view as follows: - Additional tree planting to proposed streets and publicly accessible open space would also help to break-up potential views of houses deeper within the Site, particularly those on ground that rises up to the ridgeline to the south. - In combination, the proposed mitigation measures would reduce some of the more significant visual effects created by the large commercial buildings and would help soften proposed residential development on high ground further south. However, the visual effects the Proposed Development would remain significant given the scale of the commercial buildings and the general extent of the Proposed Development within the view.
Magnitude of change with landscape mitigation in place	High to Medium
Predicted visual effects with landscape mitigation in place (residual effect)	Moderate-Major adverse, and permanent

Table 7.7.4 Mitigated Visual Effect on View 4

View 4 – Batley Road north	
Figure Reference	1.13
Type of Receptor	Road users on Batley Road
Predicted visual effects without mitigation	Moderate-Major adverse, and permanent
Proposed view with landscape mitigation	- Proposed Parameter Plan – Green Infrastructure shows a 15m wide tree belt on the eastern boundary of the Site. This would largely screen the area of Employment Use shown on Proposed Parameter Plan – Development Area and Use, and Proposed Parameter Plan - Maximum Building Heights. Landscape proposals brought forward through future reserved matters applications could further mitigate changes to the view as follows: - Deeper within the Site, additional tree planting to proposed streets and publicly accessible open space would also help to break-up potential views of commercial buildings and houses proposed on higher ground to the south-west. This tree planting strategy would extend across the Site, helping to visually break-up proposed built form in more westerly regions near Leeds Road. - As a whole, the proposed mitigation measures would serve to harmonise the Proposed Development with its surrounding context, composed of residential areas and rural fringe land. With mitigation, Proposed Development would be prominent but not necessarily considered to be substantially uncharacteristic of the view.
Magnitude of change with landscape mitigation in place	Medium
Predicted visual effects with landscape mitigation in place (residual effect)	Moderate adverse, and permanent

Table 7.7.5 Mitigated Visual Effect on View 5

View 5 – Baghill Road	
Figure Reference	1.14
Type of Receptor	Road users on Baghill Road
Predicted visual effects without mitigation	Moderate adverse, and permanent
Proposed view with landscape mitigation	- Proposed Parameter Plan – Green Infrastructure shows a 15m wide tree belt on the eastern boundary of the Site. This belt would help screen the area of Employment Use shown on Proposed Parameter Plan – Development Area and Use, and Proposed Parameter Plan - Maximum Building Heights. It is likely that roof planes would still be visible given the elevated position of the viewpoint. Landscape proposals brought forward through future reserved matters applications could further mitigate changes to the view as follows: - Additional tree planting between all commercial buildings, and on streets and publicly accessible open space between proposed houses would visually break-up built form, though complete screening would not be possible. - Proposed tree planting, together with hedgerow gapping up/management, and the retention of most on-site vegetation (hedgerows, individual trees and woodland) would help to assimilate, more sympathetically, proposed built form with the rural fringe/urban fringe landscape - The Proposed Development would introduce elements that would be prominent but may not necessarily be considered to be substantially uncharacteristic of the view. These interventions would occupy a partial proportion of the view and would likely be noticed by the observer.
Magnitude of change with landscape mitigation in place	Medium
Predicted visual effects with landscape mitigation in place (residual effect)	Moderate adverse, and permanent

Table 7.7.6 Mitigated Visual Effect on View 6

View 6 – Park at East Ardsley	
Figure Reference	1.15
Type of Receptor	Park users
Predicted visual effects <u>without</u> mitigation	Moderate adverse, and permanent
Proposed view with landscape mitigation	- A green corridor and green buffer shown on Proposed Parameter Plan – Green Infrastructure would help screen areas of residential development shown on Proposed Parameter Plan – Development Area and Use. Landscape proposals brought forward through future reserved matters applications could further mitigate changes to the view as follows: - Proposed tree planting, together with hedgerow gapping up/management, and the retention of most on-site vegetation (hedgerows, individual trees and woodland) would help to assimilate, more sympathetically, proposed built form with the rural fringe/urban fringe landscape - The Proposed Development would introduce elements that would be prominent but may not necessarily be considered to be substantially uncharacteristic of the view. These interventions would occupy a partial proportion of the view and would likely be noticed by the observer.
Magnitude of change with landscape mitigation in place	Low
Predicted visual effects with landscape mitigation in place (residual effect)	Minor-moderate adverse, and permanent

Table 7.7.7 Mitigated Visual Effect on View 7

View 7 – Batley Road (south)	
Figure Reference	1.16
Type of Receptor	Road users
Predicted visual effects without mitigation	Moderate adverse, and permanent
Proposed view with landscape mitigation	- A proposed, 15m deep, woodland belt shown on Proposed Parameter Plan – Green Infrastructure would help screen the area of Employment Use illustrated on Proposed Parameter Plans – Development Area and Use and Building Heights. It is likely that roof planes in this area would still be visible given the elevated position of the viewpoint. Landscape proposals brought forward through future reserved matters applications could further mitigate changes to the view as follows: - Additional tree planting between all commercial buildings, and on streets and publicly accessible open space between proposed houses would visually break-up built form, though complete screening would not be possible. - Proposed tree planting, together with hedgerow gapping up/management, and the retention of most on-site vegetation (hedgerows, individual trees and woodland) would help to assimilate, more sympathetically, proposed built form with the rural fringe/urban fringe landscape - Despite the above mitigation measures, the Proposed Development would still be visible and the changes transformative. It would introduce elements that would be prominent but may not necessarily be considered to be substantially uncharacteristic of the view, considering the existing urban fringe context of the Site.
Magnitude of change with landscape mitigation in place	Medium
Predicted visual effects with landscape mitigation in place (residual effect)	Moderate adverse, and permanent

Table 7.7.8 Mitigated Visual Effect on View 8

View 8 – Gawthorpe Lane, Kirkhamgate	
Figure Reference	1.17
Type of Receptor	Users of the bridleway (PROW)
Predicted visual effects without mitigation	Moderate adverse, and permanent
Proposed view with landscape mitigation	- Proposed Parameter Plan - Green Infrastructure shows a Green Buffer and Wildlife Corridor on the eastern edge of the site. This would help to soften and screen the proposed residential area shown on Proposed Parameter Plans – Development Area and Use and Building Heights. Landscape proposals brought forward through future reserved matters applications could further mitigate changes to the view as follows: - Existing hedgerows on the Site's southern boundary would be retained, gapped-up, positively managed and augmented with additional tree planting in order to help screen proposed houses. - Most on-site vegetation (hedgerows, individual trees and woodland) would be retained and strengthened by additional planting to existing field boundaries and proposed streets. Existing and proposed vegetation would form a site-wide green infrastructure network, which would help to assimilate proposed built form into the rural fringe landscape. - The Proposed Development, with mitigation, would introduce elements which are not uncharacteristic when set within the view.
Magnitude of change with landscape mitigation in place	Low
Predicted visual effects with landscape mitigation in place (residual effect)	Minor adverse, and permanent

Table 7.7.9 Mitigated Visual Effect on View 9

View 9 – PROW, south of Site	
Figure Reference	1.18
Type of Receptor	Users of the footpath (PROW)
Predicted visual effects without mitigation	Major adverse, and permanent
Proposed view with landscape mitigation	- Proposed Parameter Plan – Green Infrastructure shows a landscape corridor along the southern edge of the site. This would help to screen the area of residential use on the southern side of the site illustrated on Proposed Parameter Plans – Development Area and Use, and Building Heights. Landscape proposals brought forward through future reserved matters applications could further mitigate changes to the view as follows: - Most on-site vegetation (hedgerows, individual trees and woodland) would be retained and strengthened by additional planting to existing field boundaries and proposed streets. Existing and proposed vegetation would form a site-wide green infrastructure network, which would help to assimilate proposed built form into the rural fringe landscape. - Existing hedgerows on the Site's southern boundary would be retained, gapped-up, positively managed. This would completely screen the lower portions of proposed houses near the southern boundary, but only partially break-up views of their upper storeys. Deeper within the Site, the upper southern elevations and roof tops of house would remain visible, though proposed tree planting along PROWS and to streets would help to visually soften build form. - Tree planting to streets and publicly accessible open space in the vicinity of the proposed school and community hub would help assimilate these visually prominent buildings into surrounding context. - Though more sympathetically integrated into its surrounding context, the Proposed Development, with mitigation, would still occupy a large and extensive proportion of the view and would be easily noticed by the observer.
Magnitude of change with landscape mitigation in place	High
Predicted visual effects with landscape mitigation in place (residual effect)	Major adverse, and permanent

Table 7.7.10 Mitigated Visual Effect on View 10

View 10 – PROW connecting to Chidswell Lane	
Figure Reference	1.19
Type of Receptor	Users of the footpath (PROW)
Predicted visual effects <u>without</u> mitigation	Major adverse, and permanent
Proposed view with landscape mitigation	- Green corridors shown on the Proposed Parameter Plans would not affect the proposed view. Landscape proposals brought forward through future reserved matters applications could mitigate changes to the view as follows: - Existing vegetation located immediately south-west of the viewpoint would be retained as it serves to screen the Site from a portion of Chidswell Lane. The south-eastern side of this planting would be further augmented by tree planting to reinforce screening effects. This planting would improve the setting of proposed houses, helping to visually soften built form. - Additional tree planting to streets and within publicly accessible open space across the Site would help to visually break up built form, though the effects generated by houses that sit in close range to the viewpoint would be considerable. - Though more sympathetically integrated into its surrounding context, the Proposed Development, with mitigation, would still dominate foreground views, and foreshorten mid and long-range views
Magnitude of change with landscape mitigation in place	High
Predicted visual effects with landscape mitigation in place (residual effect)	Major adverse, and permanent

Table 7.7.11 Mitigated Visual Effect on View 11

View 11 – PROW connecting to Leeds Road, on western edge of Site	
Figure Reference	1.20
Type of Receptor	Users of the footpath (PROW)
Predicted visual effects <u>without</u> mitigation	Major adverse, and permanent
Proposed view with landscape mitigation	- The proposed green buffer shown on Proposed Parameter Plan – Green Infrastructure would offer some screening of the area of Employment Use in the north west of the site (see Proposed Parameter Plans – Development Area and Use, and Building Heights). - The proposed landscape corridor shown would be likely to provide some screening and softening of the school, and the area of residential use to the east and south east of the viewpoint. Landscape proposals brought forward through future reserved matters applications could mitigate changes to the view as follows: - Existing vegetation located immediately south-west of the viewpoint would be retained as is serves to screen the Site from a portion of Chidswell Lane. The south-eastern side of this planting would be further augmented by tree planting to reinforce screening effects. This planting would improve the setting of proposed houses, helping to visual soften built form. - Additional tree planting to streets and within publicly accessible open space across the Site would help to visually break up built form, though the effects generated by houses that sit in close range to the viewpoint would be considerable. - Though more sympathetically integrated into its surrounding context, the Proposed Development, with mitigation, would still dominate foreground views, and foreshorten mid and long-range views
Magnitude of change with landscape mitigation in place	High
Predicted visual effects with landscape mitigation in place (residual effect)	Major adverse, and permanent

Table 7.8. Summary of Visual Effects Following Mitigation

View	Proximity	Sensitivity of Visual Receptor	Magnitude of Change	Visual Effect and nature <u>without</u> Mitigation	Magnitude of change with mitigation	Visual Effect and nature with mitigation (residual effect)
1	Medium	High	Medium	Moderate-Major Adverse	Medium	Moderate-Major Adverse
2	Close	High	High	Major Adverse	High	Major Adverse
3	Medium	High	High	Major Adverse	High medium	Moderate Major Adverse
4	Medium	Medium	High	Moderate-Major Adverse	Medium	Moderate Adverse
5	Medium	Medium	Medium	Moderate Adverse	Medium	Moderate Adverse
6	Medium	Medium	Medium	Moderate Adverse	Low	Minor-Moderate Adverse
7	Long	Medium	Medium	Moderate Adverse	Medium	Moderate Adverse
8	Long	Medium	Medium	Moderate Adverse	Low	Minor Adverse
9	Close	High	High	Major Adverse	High	Major Adverse
10	Close	High	High	Major Adverse	High	Major Adverse
11	Close	High	High	Major Adverse	High	Major Adverse

Construction Effects

7.171 In order to facilitate any development on the Site, there will be a period of construction activity, which is likely to last approximately 15-20 years. The Site would be subjected to following activities during construction. These will have the potential to generate effects on landscape character and visual amenity:

- i. Material stockpiling.
- ii. Lighting of the works.
- iii. Movement and activity of construction equipment and plant.
- iv. Increase of heavy traffic to site.
- v. Other site related activities.
- vi. It is envisaged that tower cranes will be required during the construction period.

7.172 The extensive construction works, lasting a number of years, has potential to cause **major adverse, temporary** effects for residents living in close proximity to the Site and, in particular, those residents with close or mid-range views of the Site.

Mitigation of construction effects

7.173 The potential effects during construction already identified will be short term when compared to the effect of the completed development discussed below, however, they need to be addressed in order to minimise any adverse effects on surrounding receptors. In addition to the mitigation of the long-term effects of the development, a number of measures will be undertaken to minimise construction phase effects. These will include:

- i. screening of site with temporary hoarding;
- ii. managed working hours;
- iii. controlled access points;
- iv. considered location of stockpiles and equipment;
- v. considered location of temporary buildings/cabins

Predicted effects during Construction

7.174 Beyond activities on site and a short-term increase of heavy traffic to the Site, there are not likely to be any effects during the construction phase which affect areas or receptors not already affected by the development itself. For this reason, no other specific mitigation measures will be required. In conclusion, the predicted overall effect of the construction phase of the Proposed Development shown on Proposed Parameter Plan – Development Area and Use is likely to be, on balance, **moderate-major adverse** in terms of both landscape character and visual amenity. However, these effects will only exist for the construction period.

Lighting Effects

7.175 Until further details of Proposed Development are known, the effects of lighting cannot be ascertained. For the purposes of this assessment and in the absence of a lighting scheme, it can nevertheless be concluded that a greater level of development will increase lighting level throughout the Site. However, lighting will be largely limited to internal lighting generated by proposed buildings, including houses, commercial units, the school and local centre. Some external lighting will be required for the operation of the streets and around the curtilage of

proposed buildings, other than houses, so that these buildings continue to function after dark. However, potentially adverse effects will be minimised by implementing a carefully considered lighting scheme which aims to minimise light spill into the surrounding environment. On balance, it is judged that the lighting effects brought about by the Proposed Development would be **moderate-major adverse** in relation to medium and close-range views, and to local character area E8.

Mitigating lighting effects

7.176 The amount of light and 'throw' or 'spill' can be mitigated and reduced through an efficient Site-wide lighting design and appropriate shrouds, angled fittings, and low energy light fittings. On balance, it is judged that such measures could reduce the effects of development shown on Proposed Parameter Plan – Development Area and Use on visual amenity and landscape character to **moderate adverse**.

Cumulative Effects

7.177 In assessing the effects of the Proposed Development as shown on the Proposed Parameter Plans, consideration is also given to the cumulative effects generated by the development of the Heybeck Lane site, which adjoins the northern boundary of the main Site. The Heybeck Lane site, which has a gross site area of circa 7 hectares forms the northern part of allocation MXS7 in the Local Plan, is allocated for housing (HS47) in the Local Plan. In this assessment, the effects of the Heybeck Lane site are considered as additional to those of the main Site.

7.178 Since the Heybeck Lane site is under the same ownership as the Site, proposals for both have been developed in parallel. Development proposals for the Heybeck Lane site are purely residential, consisting of two to three storey dwellings, set amongst existing retained hedgerows and trees, proposed Publicly Accessible Open Space and road infrastructure.

7.179 In preparing parameter plans for the Proposed Development, consideration has also been had for a separately proposed residential site located off Chidswell Lane, south-west of the Site. Despite being under different ownership (Barratt Homes), the proposed parameter plans seek to connect and unite this site with the Proposed Development. Interventions include the creation of a road link that passes through both sites, and the strengthening of green infrastructure at the south-west edge of the Site. Though this LVA does not seek to assess the cumulative effects generated by the Site in combination with the Barratt site, it is worth noting that the cumulative visual effects between the two are limited to views from Chidswell Lane (which separates the two sites). This is because the two sites sit either side of a ridgeline, along which Chidswell Lane runs. The ridgeline represents a 'watershed' in visual terms, meaning that the Barratt site is not visible from the representative viewpoints considered in this study save, perhaps, for a reverse angle view of viewpoint 10.

Construction Phase

7.180 Construction work at the Site would follow that of the Heybeck Lane site without any overlap, so the cumulative effects of construction works on both sites is neutral. The activities associated with the construction of the Heybeck Lane Site alone would include the movement of heavy goods vehicles at access points on Heybeck Lane and Leeds Road, cranes within the Site, and general construction activity associated with the building of 2-3 storey houses and associated infrastructure (residential roads, services, lighting and green space). The residual visual and landscape effects associated with this activity would be **moderate adverse**, and temporary, lasting the duration of the construction contract.

Operational Phase

Cumulative Effects on Landscape Character

7.181 The development of the Heybeck Lane site would simply extend the changes that would be brought about by the Proposed Development at the main Site. At the level of the National Character Area, this would result in a negligible change and negligible effect because of the scales involved. At a more local level, the effects generated by the development of the Heybeck Lane site, when read as additional to those of the main Site, would be greatest for LCA, E8: Batley-Dewsbury Rural Fringes. However, because of the relatively small scale of site A, together with its physical/visual containment, and the low-level nature of the residential development, the Proposed Development for the Heybeck Lane site would not markedly change the effects already generated by the Proposed Development at the main Site. The cumulative effects of the mitigated Proposed Development for the Heybeck Lane site and the Proposed Development of the main Site, would remain **moderate-major adverse** for LCA E8: Batley-Dewsbury Rural Fringes.

Cumulative Effects on Landscape Fabric

7.182 The development of the Heybeck Lane site would extend northwards the landscape effects on agricultural land, hedgerows, trees, PROWs, and sense of tranquillity, and senses of openness generated by the Proposed Development within the main Site. Both sites are designed using the same principles, which include conserving and enhancing existing landscape assets wherever possible, together with their augmentation via additional green infrastructure proposals. The relatively small scale of the Heybeck Lane site compared with the main Site would mean that the additional effects would not be greatly exacerbated. The magnitude of the residual mitigated cumulative effects would therefore remain as per the effects generated by the main Site in isolation, for each aspect of landscape fabric previously noted.

Cumulative Visual Effects

7.183 When considered together, the Heybeck Lane site will extend northwards some of the visual effects generated by the Proposed Development of the Site. However, these will largely be limited to viewpoints in close proximity to the Heybeck Lane site. This includes viewpoint 1 (located on the north-western boundary of the Heybeck Lane site) which will experience close-range visual effects as a result of the development of Heybeck Lane site. While the visual effects (with mitigation) generated by the Proposed Development within the Site are assessed at moderate-major adverse in viewpoint 1, the magnitude of change generated by Heybeck Lane site alone is judged to be high (refer to document RFM-XX-00-LRP-0001 Land at Heybeck Lane Landscape Appraisal), making the *cumulative* change (generated by the main Site and site A in combination) high. This will produce a cumulative visual effect which is assessed as major adverse, and permanent.

7.184 Limited, medium-range cumulative visual effects will be experienced from Viewpoints 5 and 8 due to the partial visibility of Heybeck Lane site from these locations.

7.185 In respect of viewpoint 5, the visual effects (with mitigation) of the Proposed Development within the Site have been assessed as moderate adverse. Development of the Heybeck Lane site (Site A) would result in additional visible built form between houses to Heybeck Lane and Dum Wood. The magnitude of the cumulative change experienced at viewpoint 5 is judged to remain at medium, due to the distances involved and the screening effects of intervening vegetation. The cumulative visual effect of the Site and Heybeck Lane site in combination is therefore also assessed as moderate adverse, and permanent.

7.186 In respect of viewpoint 8, the visual effects (with mitigation) generated by the Site alone have been assessed as minor adverse. The magnitude of the cumulative change experienced at viewpoint 8 is judged to be low, due to the distances involved and the screening effects of existing hedgerow vegetation. Due to the small-scale visual change brought about by The Heybeck Lane site, the cumulative visual effect is also assessed as minor adverse, and permanent.

7.187 For all other representative viewpoints, there are no cumulative visual effects.

Cumulative Lighting Effects

7.188 There is the potential for the Proposed Development to generate long-term effects during the night-time periods due to additional light throw caused by illuminating streets and from internally lighting buildings, as with any form of development. These effects will add to those generated by the current context, including residential on or close to Leeds Road, Heybeck Lane, Batley Road and Chidswell Lane. Most of the lighting effects would be generated by the main Site, composed of both residential and commercial development. The proposed residential development of the Heybeck Lane site would extend these effects northwards, with the main visual receptors being residential properties on Leeds Road and Heybeck Lane. For Viewpoint 1, the cumulative lighting effects would be similar in magnitude to the daytime visual effects, i.e. major adverse. For other affected viewpoints (viewpoints 1 and 8), the effects again reflect day time effects ie moderate adverse and minor adverse, respectively.

Summary of Residual Effects

7.189 The Landscape and Visual Assessment has been undertaken in accordance with Guidelines for Landscape and Visual Impact Assessment, Third Edition (2013) published by The Landscape Institute & Institute of Environmental Management & Assessment, and Visual representation of wind farms', version 2.1, published by Scottish Natural Heritage (2014).

7.190 The baseline assessment identifies existing landscape features which are relevant to the landscape and visual context of the Site. These include valuable assets such as woodlands, hedgerows and water courses, as well as less tangible aspects such as the sense of openness and sense of tranquillity, and visual amenity.

7.191 The Site, covering c.112ha, is located c.2.5km north-east of Dewsbury town centre on agricultural land with a rolling topography. The Proposed Development consists of 1,354 dwellings, 35 hectares of employment land, a primary school, local centre, green space and other associated infrastructure. The Proposed Development would be set within an urban fringe context, with existing development located in close proximity the Site's northern, western and southern boundaries, while its eastern boundary would abut agricultural fields, designated as Green Belt. Within this Green Belt land there are two sizable tree copses, Dum Wood and Dogloitch Wood, which provide a high degree of screening immediately next to the Site. The Proposed Development incorporates measures aimed at integrating proposed built form into the existing landscape context via an extensive Green Infrastructure proposal which ties together existing landscape assets including woodland, hedgerows and water courses. These mitigation measures permeate the whole site, with particular emphasis in central regions which lie in close proximity to existing woodland copses and water courses, and proposed employment land.

7.192 The effects generated by the Proposed Development have been assessed by considering the sensitivity of relevant landscape receptors and visual receptors in combination with the magnitude of change they would experience as a result of the Proposed Development, relative to baseline conditions.

Summary of Landscape Effects

7.193 The effects on the landscape during construction will be limited and temporary and will be no greater than the long-term effects of the Proposed Development itself. Landscape effects are to be expected in relation to any form of development taking place on a site. However, in this instance, particular care would be taken to ensure that existing retained trees and woodland within and around the Site would not be damaged during the construction period.

7.194 The Site lies adjacent to, but not within, Green Belt. Although the Site is not subject to Green Belt policy, the Proposed Development would result in encroachment on the countryside and a loss of openness between settlements. However, the extant Green Belt designation would, as

intended, provide sufficient spatial buffering between existing settlement and the Proposed Development. Though the effects would be significant, the screening effects of Dum Wood and Dogloitch Wood would help to maintain the visual separation of existing and proposed built form, reducing to an extent the perception of encroachment.

- 7.195 The Proposed Development would exert a transformative effect on existing agricultural land, through the loss of all fields to proposed built form, road infrastructure and green space. Proposed built form would also bring about some localised changes to ground levels, particularly in locations where large buildings (which require a floor plate of corresponding size) are required. This includes, in particular, central regions of the Site, which are to be used for employment. However, the broader macro topography of the Site would remain as existing. All other existing landscape assets – including hedgerows, trees, water courses and public rights of way – within the Site would be retained save for a very limited number of localised changes. Moreover, these landscape features would be enhanced and augmented by additional planting and positive management of all landscape areas (including existing trees and hedgerows), forming an extensive green infrastructure network across the whole site. This network would help integrate proposed built form into the existing landscape context.
- 7.196 The character of the local landscape would be altered by the Proposed Development, which would result in the urbanisation of land currently defined as rural fringe. This would transform a wedge of agricultural land located between existing settlement, effectively pushing the urban fringe c.1.5km in a south-easterly direction. The effects would be greatest on LCA E8 Batley-Dewsbury Rural Fringes, within which the Site sits. Effects on surrounding LCAs would be limited and would result from the inter-visibility they share with the Site. The effect on the National Character Area would be negligible due to the scale of the development.

Summary of Visual Effects

- 7.197 The ZTV demonstrates that significant visual effects to the north and west of the Site are limited by the screening effects generated by existing buildings and woodland lying adjacent to or in close proximity to the Site, therefore containing views of the Site. A limited number of dwellings lining these boundaries experience close-range views of the Site, while the majority are offset and/or partially screened from the Proposed Development by off-site fields (with associated hedgerows and trees) or on-site greenspace provision.
- 7.198 Medium and long-range views from the south-west are limited by the topography of the ridge along which Chidswell Lane runs. Actual views in this region of the landscape are, again, limited to viewpoints on the boundary of the Site, with the effects being close-range and major adverse. The resulting effects will be mitigated through the planting of woodland blocks, which will visually soften proposed built form, though it will remain very apparent.
- 7.199 South of the Site, views over fields are generally open, creating a high level of inter-visibility with PROWs in this region, although inter-visibility with the settlement of Gawthorpe, located further south, is screened by intervening landform and trees. Longer-range views from Kirkhamgate located east of the M1 motorway are possible though visual effects are limited by the long distance and the quality of the intervening landscape (which includes foreground views of the M1 motorway).
- 7.200 The most significant visual effects are experienced by receptors on elevated ground east of the Site. These receptors, located in and around the residential area of East Ardsley, experience long-range panoramic views of the Site and surrounding context. The large scale, transformative nature of the Proposed Development would result in significant visual effects from residences and public areas comprising East Ardsley. Mitigation by way of an extensive green infrastructure network encompassing the whole Site would help to visually soften proposed built form and assimilate the Proposed Development amongst existing landscape features. Although this will serve to visually soften the proposed buildings and roads, the

transformative nature of the Proposed Development means that mitigation would have only a limited ability to significantly reduce the inherent visual effects generated by a development of this scale and extent on such a visually open landscape.

Table 7.9 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
<i>Construction Phase</i>			
Major adverse temporary effects on visual amenity	Residents with close and mid-range views of the Site	Screening of site with temporary hoarding; managed working hours; controlled access points; considered location of stockpiles and equipment; considered location of temporary buildings/cabins	Moderate-major adverse temporary effect
<i>Operational Phase</i>			
Negligible effect on NCA 38		None	Negligible effect on NCA 38
Moderate-Major effect on LCA E8		Retention of existing Site assets including the vast majority of trees and hedgerows, and all PROW	Moderate-Major effect on LCA E8
Negligible effect on LCA Northern Coalfield		None	Negligible effect on LCA Northern Coalfield
Negligible effect on LCM 6		None	Negligible effect on LCM 6
Negligible effect on LCM 8		None	Negligible effect on LCM 8
Minor-moderate adverse effect on Settlement		Commercial buildings to be located within central, low parts of Site. Street orientation to run with existing contours where possible, pattern and grain of built form to complement surrounding residential areas and to also incorporate green infrastructure.	Minor-moderate adverse effect on Settlement
Moderate adverse effect on Topography		Minimal disruption to existing topography. Perceived changes minimised by incorporating green/blue infrastructure.	Minor-moderate adverse effects on Topography
Major effect on Agricultural Land		None	Major effect on Agricultural Land
Minor adverse effect on Hedgerows		Gapping up, relaying and positive management of hedgerows.	Minor beneficial effect on hedgerows

Minor-Moderate adverse effect on Trees		Retention and positive management of existing trees. Extensive planting of new trees within proposed greenspaces, street and around Site boundaries.	Moderate beneficial effect on Trees
Moderate adverse effect on Water Courses		Retention of exiting watercourses. Addition of proposed SuDS features to form an integrated blue infrastructure proposal.	Moderate, beneficial
Moderate-major adverse effect on PROW		Retention of all PROW. Creation of additional connections within site. Planting along routes to mitigate against effects on amenity and character of routes.	Minor-moderate adverse effect on PROW
Major adverse effect on Sense of Tranquillity		Creation of quiet places within extensive green infrastructure proposals spanning the entire Site.	Moderate-Major adverse effect on Sense of Tranquillity
Major adverse effect on Sense of Openness		None	Major adverse effect on Sense of Openness
Moderate-Major adverse effects on view 1	Residents	Retention and positive management of existing hedgerows and trees, to provide screening. Additional tree planting within Site and to its boundaries. Extensive green/blue infrastructure across the whole Site to visual complement proposed built form.	Moderate-Major adverse effects of view 1
Major adverse effects on view 2	Users of PROW	As above	Major adverse effects on view 2
Major adverse effects on view 3	Residents	As above	Moderate-Major adverse effects on view 3
Moderate-Major adverse effects on view 4	Road users	As above	Moderate adverse effects on view 4
Moderate adverse effects on view 5	Road users	As above	Moderate adverse effects on view 5
Moderate adverse effects on view 6	Park users	As above	Minor-Moderate adverse effects on view 6
Moderate adverse effects on view 7	Road users	As above	Moderate adverse effects on view 7
Moderate adverse effects on view 8	Users of PROW	As above	Minor adverse effects on view 8

Major adverse effects on view 9	Users of PROW	As above	Major adverse effects on view 9
Major adverse effects on view 10	Users of PROW	As above	Major adverse effects on view 10
Major adverse effects on view 11	Users of PROW	As above	Major adverse effects on view 11

Summary

- 7.201 Overall, it is considered that, despite its transformative nature, the Proposed Development could be incorporated into the surrounding landscape context without major harm to landscape character and fabric, notwithstanding the loss of agricultural land. The principles for future development as shown on the proposed parameter plans has been carefully designed in a manner which respects and responds to existing settlement pattern and landscape assets such as topography, hedgerows, trees, water courses, and offsite woodland copses. Mitigation measures would ensure that these assets are conserved, protected and enhanced, and future reserved matters applications would further augment these features by additional planting within a comprehensive green infrastructure proposal. This planted network would reinforce landscape character and bring about environmental benefits such as wildlife habitat and corridors, storm water relief, visual amenity, and recreational functions.
- 7.202 The most significant visual effects are experienced from existing residential development at East & West Ardsley, which sit on elevated ground east of the Site. These receptors experience medium-range panoramic views of the landscape, which includes direct views of the Site, sitting at a lower elevation. There are also high levels of visual effects for users of public rights of way through or close to the site. The transformative nature of the Proposed Development will result in significant effects but these will be mitigated by green infrastructure proposals which will help to screen and soften the appearance of the proposed development. Detailed landscape schemes brought forward at reserved matters stage would further help to assimilate proposed built form within the surrounding landscape by strengthening existing landscape features and by extending this network throughout the Site. Though mitigation measures might not significantly reduce some adverse effects to landscape fabric and visual amenity, they nonetheless positively contribute to the creation of a sustainable development.

References

- i. Kirklees Local Plan (February 2019)
- ii. National Planning Policy Framework (revised February 2019)
<https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- iii. Department for Communities & Local Government, Planning Practice Guidance,
<http://planningguidance.planningportal.gov.uk/blog/guidance/>, accessed on-line 2014
- iv. Guidelines for Landscape and Visual Effect Assessment (GLVIA) Third edition
Published by the Landscape Institute and the Institute of Environmental Management & Assessment (IEMA)
- v. National Character Area (NCA) 38: Nottinghamshire Derbyshire and Yorkshire Coalfields, as defined by Natural England.
- vi. Local Character Area (LCA) E8: Batley-Dewsbury Rural Fringes, as defined by the Kirklees District Landscape Character Assessment.
- vii. LCA Northern Coal Field, as defined by the Landscape Character Assessment of Wakefield District.
- viii. LCA Arable Fringe Farmland, as defined by the Leeds Landscape Assessment.

8 Heritage

9 Noise and Vibration

Introduction

- 9.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development upon the Site and surrounding area with respect to Noise and Vibration. This Chapter also describes the methods used to assess these effects, the existing baseline conditions, the proposed mitigation measures required to prevent, reduce or offset any significant negative impacts and the likely residual impacts after these methods have been adopted.
- 9.2 The Chapter has been completed on behalf of Delta-Simons by Weigang Wei PhD MIOA who has over five years experience in Noise and Vibration. It has been reviewed by Nick Conlan BEng MIOA who has over twenty years experience in Noise and Vibration and both consultants are full Members of the Institute of Acoustics (MIOA).
- 9.3 This Chapter is accompanied by three technical appendices:
- Baseline noise survey details (Appendix 9.1);
 - Acoustic modelling and predicted noise levels (Appendix 9.2); and
 - Glossary and abbreviations (Appendix 9.3)

Legislative and Policy Context

- 9.4 Legislation and policy specifically relevant to this Proposed Development is outlined in this section. The noise and vibration assessment will be carried out with due regard to the following guidance:
- The Town and Country Planning (Environmental Impact Assessment) Regulations (EIA, 2017 Regulations);
 - National Planning Policy Framework (NPPF, 2019);
 - Noise Policy Statement for England (NPSE, 2010);
 - Planning Practice Guidance (PPG, 2019);
 - Guidance for Environmental Noise Impact Assessment, Institute of Environmental Management and Assessment (IEMA 2014)
 - British Standard 8233:2014: Sound Insulation and Noise Reduction for Buildings (BS 8233, 2014);
 - Design Manual for Roads and Bridges (DMRB, 2019);
 - Calculation of Road Traffic Noise (CRTN, 1988);
 - British Standard 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites (BS 5288-1, 5288-2, 2014);
 - British Standard 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound (BS 4142, 2019);
 - British Standard 7385 Part 2: Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration' (BS 7385-2, 1993);
 - British Standard 6472-1 'Guide to evaluation of human exposure to vibration in buildings' (6472-1, 2008);
 - West Yorkshire Planning Consultation Guidance – Noise & Vibration.

EIA 2017 Regulations

- 9.5 This regulation gives principles of when and how to carry out an Environmental Impact assessment. It also lists the requirements of the information which should be given in an Environmental Statement.

NPPF 2019

- 9.6 National Planning Policy Framework (NPPF) (MHCLG, 2019) states that the planning system is required to contribute to and enhance the natural and local environment.
- 9.7 Consequently, the aim is to prevent both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution.
- 9.8 All planning policies and decisions should aim to avoid noise from giving rise to significant adverse impacts on health and quality of life as result of new developments. Where other adverse impacts occur these should be mitigated or reduced to a minimum, including through the use of conditions.
- 9.9 With regards to “adverse effects” and “significant adverse effects” the NPPF refers to the Noise Policy Statement for England Explanatory Note (NPSE) (DEFRA, 2010).

NPSE 2010

- 9.10 NPSE sets out the long term vision of the government’s noise policy, which is to “promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development”.
- 9.11 This long-term vision is supported by three aims:
- avoid significant adverse impacts on health and quality of life;
 - mitigate and minimise adverse impacts on health and quality of life; and
 - Where possible, contribute to the improvements of health and quality of life.
- 9.12 The “Explanatory Note” within the NPSE provides further guidance on defining “significant adverse effects” and “adverse effects” using the concepts:
- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
 - Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
 - Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

PPG-N 2019

- 9.13 This guidance gives advice on how planning can manage potential noise impacts in new development.
- 9.14 The Planning Practice Guidance for noise (NPPG) broadly considers the same issues as demonstrated within both the NPPF and the NPSE with regards to noise within the planning realm and guides the Local Planning Authority (LPA) to take account of the impact of noise relative to the observed effect level determined.
- 9.15 The NPPG describes noise that is not noticeable to be at levels below the NOEL. It describes a range of noise exposure that is noticeable but not to the extent there is a perceived change in quality of life. Noise exposures in this range are below the LOAEL and need no mitigation. On this basis, the audibility of noise from a development is not, in itself, a criterion to judge noise effects that is commensurate with national planning policy.
- 9.16 The NPPG suggests that noise exposures above the LOAEL cause small changes in behaviour. An example of noise exposures above the LOAEL provided in the PPG is having to turn up the volume on the television; needing to speak more loudly to be heard; or, where there is no alternative ventilation, closing windows for some of the time because of the noise.

- 9.17 In line with the NPPF and NPSE, the NPPG states that consideration needs to be given to mitigating and minimising effects above the LOAEL but taking account of the economic and social benefits being derived from the activity causing the noise.
- 9.18 The NPPG suggests that noise exposures above the SOAEL cause material changes in behaviour. An example of noise exposures above the SOAEL provided in the NPPG are, where there is no alternative ventilation, keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. In line with the NPPF and NPSE, the NPPG states that effects above the SOAEL should be avoided and that whilst the economic and social benefits being derived from the activity causing the noise must be taken into account, such exposures are undesirable.

IEMA 2014

- 9.19 This guidance addresses the key principles of noise impact assessment, and provide specific support on how noise impact assessment fits within the Environmental Impact Assessment (EIA) process.
- 9.20 These guidelines define core methods and techniques for Environmental Impact Assessment captured within the EIA Regulations. It also refers to the requirements in NPPF and NPSE.
- 9.21 In IEMA 2014, a Noise Effect is defined as the consequence of the noise impact. This may be in form of change in noise level, change in degree of intrusion or perceived change in quality of life. The effect will be also dependent on the receptor and sensitivity. The Significance of Effect is defined as the evaluation of the noise effect, and deciding whether or not that impact is significant.

BS 8233 2014

- 9.22 BS 8233 gives guidance for the control of noise in and around buildings. It is applicable to the design of new buildings. It provides recommended internal noise levels for dwellings, noise levels in external amenity spaces. This standard also refers to the noise study in relevant WHO guidance.

DMRB 2019

- 9.23 This guidance describes the procedure to assess the impact due to changes in noise level or vibration level for construction, operation or maintenance of highway projects. The methodology of noise and vibration assessment from construction noise and vibration and operational noise. Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities. Therefore, operational vibration will not have the potential to lead to significant adverse impact.

CRTN 1988

- 9.24 This guidance describes the procedure for calculation noise from road traffic based on number of vehicles, vehicle speed, percentage of heavy goods vehicles and road surface conditions etc. This calculation method is widely used in the assessment of road traffic noise and is the method referred in DMRB.

BS 5228-1 and BS 5228-2 2014

- 9.25 BS 5228-1 is the Code of practice for noise and vibration control on construction and open sites – Part 1: Noise. This standard gives recommendations for basic methods of noise control relating to construction sites. This standard also provides guidance concerning methods of predicting and measuring noise and assessing its impacts on those exposed to it.
- 9.26 BS 5228-2 is related to vibration control on construction site. This standard gives guidance of the procedures for vibration control in respect of construction operations. This guidance also refers to the more detailed vibration impact assessment standards to assist the engineers, Environmental Health Officers and Planners.

BS 4142 2019

- 9.27 This standard describes methods for rating and assessing sound of an industrial and/or commercial nature in terms of the potential adverse impact on residents. The specific sound source of an industrial and/or commercial nature is rated by comparing against the existing background sound environment in a certain context. The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact.

BS 7385-2 1993

- 9.28 This standard gives guidance of the assessment methodology and recommended levels of vibration above which building structures could be damaged. It identifies the factors which influence the vibration of buildings and describes the basic procedure for vibration measurements.

BS 6472-1 2008

- 9.29 This standard provides guidance on evaluating building vibration on human response in terms of vibration dose value (VDV). This standard describes the procedure to measure / calculate the VDV and the methodology to use the calculated / measured VDV to estimate the probability of adverse comments.

West Yorkshire Planning Consultation Guidance – Noise and Vibration (2016)

- 9.30 This guidance reflects the noise related guidance within NPPF (2012) and NPSE (2010). This guidance also gives guideline values on the Lowest Observed Adverse Effect Level which is in line with the recommended levels in BS 8233:2014. The industrial / commercial noise impact assessment criteria are also recommended in this guidance.

Legislation

- 9.31 Additional statutory powers exist outside the Planning system and the granting of planning approval does not remove the need to comply with these controls. The major legislative instruments relevant to the scheme are:
- 9.32 The Control of Pollution Act 1974 (Part III) provides guidance on the control of noise and vibration from the construction phase of a development to minimise the potential impacts at the nearest neighbouring premises. Section 60 and 61 of the Act enables the Local Authority to agree noise limits during key construction activities to protect residents.
- 9.33 The Environmental Protection Act 1990 (Part III) as amended by the Noise and Statutory Nuisance Act 1993, which requires Local Authorities to serve notices where noise emitted from premises is considered to constitute or likely to constitute a statutory nuisance.
- 9.34 It is usual for the implementation of both legislative powers to be applied under delegated powers by the Environmental Health department of the relevant Authority, in this case Kirklees.

Assessment Methodology and Significance Criteria

- 9.35 This section sets out the methodology used in the determination of both the baseline conditions and the assessment of likely significant effects, using the relevant guidance documents set out in the previous section.
- 9.36 A desk study was undertaken to collate available site plans to identify nearby receptors and building uses. The traffic data for construction and operation noise was reviewed to establish the extent of the study area which needed to be assessed. This information was used to identify the appropriate locations for baseline monitoring. These included locations close to the receptors on the site boundary and the residential receptors on the nearby roads which would be subject to increased traffic movements.

Impact assessment methodology

- 9.37 This methodology has been proposed within the EIA Scoping and the local authority response was that the proposed methods and guidance appear suitable in assessing all related noise issues.

9.38 The overall approach to the assessment comprises:

- A review of the existing noise at the Site;
- Noise and vibration impacts arising from construction processes affecting the noise sensitive receptors;
- Noise impacts to future residents within the site from existing transport or industrial related noise sources;
- Noise impacts to existing and future residents from changes in traffic associated with the Proposed Development;
- Noise impacts to existing and future receptors from mechanical building services plant and operations of the non-residential buildings associated with the Proposed Development; and
- Formulation of mitigation measures, where appropriate, to ensure any adverse effects of noise are minimised.

9.39 The assessment is split into the construction phase and operational phase assessments to allow for separate consideration of construction and operational noise and vibration impacts on sensitive receptors.

Construction Phase – on site construction noise

9.40 Table E.1 of BS5228-1(BSI,2014) provides a methodology for determining the potential significance of noise effects due to construction activities, based on the periods of construction (daytime, evening and night-time) and the baseline ambient noise levels at the receptors.

9.41 The baseline ambient noise levels are rounded to the nearest 5dB and then allocated into a threshold category (A to C). The predicted construction noise levels are then assessed against the corresponding noise threshold value. If the noise threshold value is exceeded, a potential significant impact may be considered to occur.

9.42 The standard then states that the assessor needs to consider other project specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect.

9.43 The nearest noise sensitive receptors exposed to construction noise are:

- existing properties on Leeds Roads, Heybeck Lane, Willerton Close, Chidswell Lane and Manor Park; and
- new properties the Site due to early construction stages.

9.44 At this stage, before the appointment of a contractor, no specific details on the construction activities, programme or number and type of construction plant are currently available. Therefore, detailed construction noise predictions at specific receptors have not been completed.

9.45 Instead, a qualitative approach has been adopted focussing on the likely noisy construction activities and based upon BS 5228-1 and best practice mitigation measures. The assessment therefore focuses on the impact at existing residential properties and properties likely to be completed before the Proposed Development

Construction Phase – off-site construction traffic

9.46 The Proposed Development will generate additional off-site traffic which will include the movement of materials and equipment via HGVs and the movement of the workforce associated with the construction.

9.47 DMRB states that a change of 1 dB $L_{A10,18hr}$ in the short term is the smallest change considered perceptible and that a change in traffic noise levels of 1 dB, $L_{A10,18hr}$ is equivalent to a 25% increase in traffic flow.

9.48 Therefore, if the change is traffic flows due to construction traffic is less than 25% the change will be not significant.

Construction Phase – Vibration

- 9.49 BS5228-2 (BSI,2014) gives guidance on vibration levels that can be used to assess the likely impacts of construction activities.
- 9.50 Annex E of the standards provides formulae for the prediction of peak particle velocity (PPV) vibration levels for various types of vibratory compaction, percussive and vibratory piling.
- 9.51 Different scaling factors are provided in BS 5228 for vibration predictions which correlate to the percentage probability of the predicted values being exceeded, with 5% being the most onerous, and generates the highest PPV values.
- 9.52 At this stage the main potential source of vibration is the use of vibratory rollers to compact the ground during the engineering works for the construction of the new roads within the proposed development.
- 9.53 To give an indication of possible vibration impacts due to the use of vibratory rollers to compact the site an estimate of vibration levels has been completed. This has been based on predictions for a medium sized twin drummed vibratory roller (Bomag BW90-AD5), using the empirical relationships provided in BS 5228-2.
- 9.54 BS 7385-2 'Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration provides guidance on vibration levels likely to result in cosmetic damage, and is referenced in BS 5228-2.
- 9.55 Levels of vibration required to cause cosmetic building damage are considerably greater than the levels which effect human response and as there are no structurally sensitive building identified close to the site, building damage has not been assessed within this chapter.

Operational Phase – Road Traffic Noise

- 9.56 The Proposed Development will have an impact on traffic flows on existing roads in the area surrounding the site once the development is operational. Primary spine roads and secondary distribution roads will also be built in the Proposed Development. The assessment focuses on the impact
- at existing residential properties located on affected roads; and
 - at the proposed new buildings from the existing and new roads.
- 9.57 The noise impact from road traffic noise in the operational phase will be assessed following the guidance in IEMA and DMRB. According to both IEMA and DMRB, the noise impact can be determined by the magnitude of noise change.
- 9.58 According to IEMA, the noise impact should be determined by the change of a particular noise indicator, the type of noise sources, the nature of change or other factors including absolute levels and noise indicator.
- 9.59 DMRB provides similar guidance as IEMA regarding the change of noise indicators. In DMRB, the preferred noise indicator is $L_{A10,18hr}$. The noise impact should be assessed by short-term change and long-term change.
- 9.60 For this development, the site will not become open in a single year, and the changes in noise level due to changes in traffic flow would be gradual over the development period and the development can be phased so that no increase of traffic flow of more than 25% occurs over any one year period.
- 9.61 The appropriate assessment for this development, based on DMRB methodology, would be to assess the long term effects by comparing the baseline conditions with the Do something conditions in 2030 when the Proposed Development completes. This is consistent with the principle set out in IEMA guidance.

- 9.62 The noise indicator $L_{A10,18hr}$ used in DMRB guidance will be used in this assessment to quantify the magnitude of noise impact.
- 9.63 The adopted noise impact assessment scenario will be:
- Long term: Do-something completion year 2030 (DSCY) compared against the Do-minimum baseline year 2019 (DMBY); and
 - Non-project noise change: Do-minimum completion year (DMCY) compared against Do-minimum baseline year (DMBY).
- 9.64 CadnA noise modelling software has been used to predict road traffic noise at each road traffic noise receptor following the methodology of Calculation of Road Traffic Noise, CRTN, (DTWO,1988). Further details of the noise modelling are provided in Appendix 9.1.
- 9.65 The traffic noise receptors have been selected to represent the residential dwellings on Leeds Road, Heybeck Lane, and Chidswell Lane. The selected traffic noise receptors are listed in **Table 9. 1** and illustrated in **Error! Reference source not found.**

Table 9. 1 – Traffic Noise Receptors

Reference	Description
Chidswell Lane receiver;	To represent the residential receptors on Chidswell Lane
Leeds Road receiver	To represent the residential receptors on Leeds Road
Heybeck Lane receiver	To represent the residential receptors on Heybeck Lane

Operational Phase – Road Traffic Vibration

- 9.66 Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities. Therefore, operational vibration will not have the potential to lead to significant adverse impact.

Operational Phase - Building Services

- 9.67 At this stage, no details of any building services plant are available. Such plant may be required at the new school, community facilities and the employment areas. As no details of the location, number or type of plant are currently known the assessment focuses on appropriate noise criteria for such plant, which if complied with, would ensure no significant effects on existing or proposed receptors.
- 9.68 BS 4142 (BSI,2014) describes methods for rating and assessing sound of an industrial and/or commercial nature in terms of the potential adverse impact on sound sensitive receptors.
- 9.69 According to BS 4142:
- "A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context."
 - "A difference of around + 5dB is likely to be an indication of an adverse impact, depending on the context".
 - "Where the rating level does not exceed the background sound level, this is an indication of the specific source having a low impact, depending on the context. "

Operational phase – school activities

- 9.70 In addition to plant noise, there will be activity noise from the school, associated with outdoor play and sports areas and potential noise breakout from the school during musical or performance events.
- 9.71 The nearest receptors to the school will be new residential properties within the Proposed Development.

9.72 The character of the noise from the school will be as you would expect within a suburban area.

9.73 WHO guidelines (WHO, 1999) state that for outdoor areas during a daytime period few people are highly annoyed at $L_{Aeq,16hr}$ levels of below 55dB, and few people are moderately annoyed at $L_{Aeq,16hr}$ levels of below 50dB.

Sensitivity of receptors

9.74 The sensitivity of receptors to noise impacts during operation have been defined in Table 9. 2.

Table 9. 2 – Sensitivity of the receptors

Sensitivity / Value of receptor	Description
High	Residential properties, educational buildings, medical facilities
Medium	Places of worship, community facilities
Low	Commercial premises
Very low	Industrial premises

9.75 The identified existing noise sensitive receptors are shown as follows:

- Residential properties on Heybeck Lane, Leeds Road, Chidswell Lane; and
- A public house on Chidswell Lane

9.76 The noise sensitive receptors within the Proposed Development include:

- Residential properties;
- A primary school;
- A local centre; and
- Employment areas which may include commercial premises and industrial premises.

9.77 No other type of noise sensitivity receptors is identified.

Significance Criteria

Construction Phase – Site Noise

9.78 BS 5228 describes a few methods to determine the significance of the construction noise effects. The threshold of the appropriate absolute noise level based on the ambient noise level is commonly used. The ambient noise level is used to define the assessment category.

9.79 The quietest facades of all the nearby residential receptors would be in Category A and the applicable threshold values for significance are shown in

9.80 **Table 9. 3.**

Table 9. 3 – Threshold of Potential Significant Construction Noise at Dwellings

Assessment category and threshold value period	Significance level	
	Not significant	Significant
Category A Daytime (07:00 – 19:00) and Saturdays (07:00 to 13:00)	$\leq 65 \text{ dB } L_{Aeq,12hr}$	$> 65 \text{ dB } L_{Aeq,12hr}$

Construction Phase – Vibration

9.81 Annex B of BS 5228 includes criteria for the assessment of the significance of vibration effects and includes a table, reproduced as **Table 9. 4**, which shows the guidance on effects of vibration levels.

Table 9. 4 – Threshold of Potential Significant Construction Noise at Dwellings

Continuous Vibration, Peak Particle Velocity, (PPV) mms^{-1}	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration
0.3	Vibration might be just perceptible in residential environments
1.0	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if warning and explanation has been given to residents
1.0	Vibration is likely to intolerable for any more than a very brief exposure to this level

9.82 The levels above 1.0 mms^{-1} are considered to give rise to significant effects for residential receptors and the significance level associated continuous vibration is summarised in **Table 9. 5**.

Table 9. 5 – Significance of Continuous Vibration Level on Residential Receptors

	Significance level	
	Not significant	Significant
Continuous vibration PPV from construction activities	$\leq 1.0 \text{ mms}^{-1}$ PPV	$> 1.0 \text{ mms}^{-1}$ PPV

Operational Phase – magnitude of impact criteria for road traffic noise

9.83 The absolute noise levels from road traffic which could lead to LOAEL or SOAEL are shown in Table 9. 6 according to DMRB.

Table 9. 6 – Operation noise LOAELs and SOAELs for all receptors

Time period	LOAEL	SOAEL
Day (06:00 – 24:00)	55 dB $L_{A10,18\text{hr}}$ façade	68 dB $L_{A10,18\text{hr}}$ façade
Night (00:00 – 06:00)	40 dB $L_{\text{night outside}}$ (free-field)	55 dB $L_{\text{night outside}}$ (free-field)

9.84 The magnitude of impact for long term changes in traffic noise levels, taken from DMRB are shown in Table 9. 7. The magnitude of impact described in an example working table in IEMA guidance is consistent with Table 9. 7.

Table 9. 7 – Magnitude of Impact for Long Term Changes in Road Traffic Noise Levels

Magnitude of Impact	Long Term Change in Traffic Noise Level $L_{A10,18\text{hr}}$ dB
Major	≥ 10
Moderate	5 to < 10
Minor	3 to < 5
Negligible	< 3

9.85 According to DMRB, if the initial assessment indicates an impact of “Negligible” or “Minor” magnitude, then the noise effect is unlikely to be significant. Otherwise, the long-term magnitude due to noise level changes and absolute noise levels should be considered when deciding the significance of the noise effect.

Operational Phase – magnitude of impact criteria for building services

9.86 Following the methodology of BS4142 the magnitude of impacts for mechanical services noise, on new or existing receptors are shown in Table 9. 8.

Table 9. 8 – Magnitude of Impact for Building Services Noise

Magnitude of Impact	Noise rating level – background noise
High	10dB above
Medium	5dB above
Low	< background
Very Low	5dB below

Operational Phase – magnitude of impact criteria for school activities

9.87 The noise from school activities can be assessed following the WHO guidelines for community noise.

9.88 The guideline values are average levels over the daytime period and the magnitude of impact can be assigned to the levels based on the likelihood and level of annoyance. These are shown in Table 9. 9.

Table 9. 9 – Magnitude of Impact for School Activity Noise

Magnitude of Impact	Daytime noise levels at receptors, $L_{Aeq,10hr}$ dB
High	< 60
Medium	< 55
Low	< 50
Very Low	< 45

9.89 Taking into account the sensitivity of the receptor and the magnitude of impact and using professional judgement the significance of noise effects during operation is set out in

9.90 Table 9. 10. For the operational phase, the significance of an effect is determined by integrating the magnitude of the impact and the sensitivity or value of the affected receptor.

Table 9. 10 – Significance of Effects

Sensitivity of Receptor	Magnitude of impact			
	High	Medium	Low	Very low
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible
Very low	Negligible	Negligible	Negligible	Negligible

9.91 Based on the guidance above:

- Major and Moderate effects are considered to be Significant; and,
- Minor and Negligible effects are considered to be Not Significant.

Assumptions and Limitations

9.92 No specific details on the construction activities, programme or type of construction plant are currently available at this stage. Therefore, a qualitative approach for the construction noise impact has been carried out.

9.93 The traffic flow data is based on transportation simulations, traffic count from major roads and commonly used models for prediction of traffic flow increase.

9.94 The traffic data provided for the noise assessment is as agreed during Scoping for the Transport Assessment and it doesn't match the required information for a DMRB Noise Assessment. The traffic data has been used to assess the long term changes in traffic noise, based on the change between the 2019 baseline and 2030 do-something scenarios, which follows the principals of DMRB, but is not precisely as stated in the guidance.

9.95 The sound propagation is modelled by Cadna/A software implementing the widely used noise prediction and propagation methods such as CRTN.

Baseline Conditions

9.96 The baseline noise conditions were measured by Apex Acoustics Ltd. The details of the noise surveys are provided in Appendix 9.1 and summarised in this chapter.

Noise monitoring locations and protocol

9.97 The noise monitoring locations are listed in Table 9. 11. and shown in **Error! Reference source not found..**

Table 9. 11 – Baseline noise measurement positions

Noise Monitoring Location Reference	Description of Monitoring Location
LT1	130m to Leeds Road, and 180 m to Heybeck Lane
LT2	150 m to Chidswell Lane
ST1	45 m to Heybeck Lane, behind houses
ST2	50 m to Leeds Road
ST3	75 m to Chidswell Lane
ST4	7 m to Heybeck Lane kerb
ST5	2.5 m to Heybeck Lane kerb
ST6	7 m to Leeds Road kerb
ST7	1.8 m to High Street kerb

Noise Monitoring Location Reference	Description of Monitoring Location
ST8	8 m to Chidswell Lane kerb
ST9	6 m to Windsor Road kerb

Noise monitoring results

9.98 The measured long term noise levels are shown in Table 9. 12.

Table 9. 12 – Traffic Noise Levels at Long Term Monitoring Locations

Position	$L_{Aeq,16hr}$ dB	$L_{Aeq,8hr}$ dB	$L_{A10,18hr}$ dB
LT1	53	47	55
LT2	49	42	50

9.99 The measured levels of $L_{Aeq,T}$ and the calculated levels of $L_{A10,18hr}$ at the short-term monitoring locations, due to traffic noise are provided in Table 9. 13.

Table 9. 13 – Traffic Noise Levels at Short Term Monitoring Locations

Position	$L_{Aeq,T}$ dB	$L_{A10,18hr}$ dB
ST1	47	-
ST2	53	-
ST3	55	-
ST4	71	74
ST5	70	74
ST6	72	75
ST7	65	69
ST8	59	62
ST9	59	62

Identification and Evaluation of Likely Significant Effects

Construction noise – site activities

9.100 Specific details of activities and associated plant are not available at this stage; however, it is likely that most equipment on site will be mobile plant required to excavate and move material.

9.101 In terms of the likely noise impacts the earthworks to remove topsoil, excavate the ground, and refilling to the finished level are likely to be the source of the main noise impacts at nearby receptors.

9.102 The residential receptors that will be exposed to the highest levels of construction noise are likely to be the existing houses on Leeds Road, and new houses at the proposed Site.

9.103 Receptors may experience some construction noise levels which will cause a significant effect, when activities occur close to the site boundary.

9.104 Due to the large size of the site, the duration of mobile plant activities near any single receptor on the site boundary is likely to be limited. When works occur away from the site boundaries the magnitude of the construction noise levels at existing properties will be considerably reduced.

9.105 The construction noise effects for individual dwellings would normally be temporary and short term but they could cause significant adverse effects without appropriate mitigation.

Construction Traffic

9.106 Estimates of construction traffic are a worst case of 100 HGVs and 200 staff vehicle two-way movements per day, which will access the site from the proposed site access.

9.107 The traffic flow (18 hours) of the site access road in the baseline year are shown in Table 9. 14. The worst-case construction traffic is less than 10% of the existing traffic on the access road to Site Access 1, 2, 3 and 4. However, it's equivalent to the access road to Site Access 5. The change in noise levels due to the construction traffic will not be perceivable when access from Site Access 1, 2, 3 and 4 if the construction traffic is suitably managed, in terms of routes and hours of delivery.

9.108 The construction traffic will have major impact on the residents on the Chidswell Lane to Site Access 5.

Table 9. 14 – Traffic flow and HGV% on the site access road in the baseline year 2019

Road	Site Access	Worst case construction traffic flow	18 hr AAWT flow in 2019	Increase of traffic flow	Magnitude of impact	Likely significance
Heybeck Lane	1	100 HGVs and 200 staff vehicles	6938	4%	Negligible	Not significant
Leeds Road	2, 3		>22000	1%	Negligible	
Chidswell Lane (Leeds Rd to Windsor Rd)	4		3027	10%	Minor	
Chidswell Lane (East of Windsor Rd)	5		375	80%	Major	Significant

9.109 A construction management plan (CMP) should be prepared, to ensure that all reasonable steps are taken to minimise and mitigate adverse effects from construction traffic.

9.110 The CMP should include details of:

- The agreed construction opening hours & vehicle delivery hours;
- The proposed site compound and manoeuvring arrangements; and
- Off site vehicle routing.

9.111 A benefit of the Proposed Development is its proximity to the Leeds Road which should be encouraged as the main route for vehicles to and from the Site.

9.112 With suitable routing and hours of delivery, the effects from the construction traffic will be not significant.

Construction vibration

9.113 It is not known at this stage, if any piling is required for the construction of the buildings, it is therefore considered that the vibratory compaction of new roads is likely to be the highest vibration source for the existing receptors.

9.114 The predicted vibration levels in Table 9. 15 are for a twin drum roller and include a scaling factor of 276, which is based on a 5% probability that these levels are exceeded.

Table 9. 15 – Prediction vibration levels due to steady state compaction

Distance from source to receiver	10 m	20 m	30 m	50 m
Predicted PPV	2.7 mm/s	1.0 mm/s	0.6 mm/s	0.3 mm/s

9.115 Where the distance from source to receiver is less than 20m, values of 1mm/s may be exceeded and significant effects may occur.

9.116 Without mitigation, the vibration levels could be significant adverse due to compaction activities.

Operational Noise – Change in traffic noise

9.117 The noise levels at the existing receptors from traffic on existing roads has been predicted at 1.5m to represent the noise impact for ground floor rooms.

9.118 Based on the initial assessment, the most affected noise sensitive receptors are residential on Leeds Road, Heybeck Lane, and Chidswell Lane. Following the guidance in DMRB, these noise sensitive receptors are group to three receivers (most affected) to represent the noise impact on the noise sensitive receptors. The calculated noise level at each dwelling house is presented in a noise level contour map as shown in Appendix 9.2.

9.119 The noise maps from the noise model are illustrated in Appendix 9.2 for each scenario. A summary of the noise maps is presented in Table 9. 16.

Table 9. 16 – Summary of Noise Maps Included within the Figures

Scenario	Receptor height	Figure reference
Baseline year 2019	1.5 m	Error! Reference source not found.
Do something 2030	1.5 m	Error! Reference source not found.
Do minimum 2030	1.5 m	Error! Reference source not found.

9.120 The predicted noise levels at each receptor, and for each scenario are presented in Table 9. 17.

Table 9. 17 – Predicted noise levels in different scenario

Receptor	Receptor height	Predicted noise levels, $L_{A10,18hr}$ for each scenario		
		Baseline year 2019	DM 2030	DS 2030
Chidswell Lane receiver	1.5 m	63.4	64.5	67.4
Leeds Road receiver	1.5 m	46.8	47.9	49.0
Heybeck Lane receiver	1.5	47.7	48.8	49.7

9.121 The magnitude of impact and significance of effects associated with the long-term changes in traffic are provided in Table 9. 18.

Table 9. 18 – Long term noise impact, DSCY - DMBY

Receptor	Heights	Change in level (dB)	Magnitude of impact	Significance of effect
Chidswell Lane receiver	1.5 m	4.0	Minor	Not significant
Leeds Road receiver	1.5 m	2.2	Negligible	Not significant
Heybeck Lane receiver	1.5 m	2.0	Negligible	Not significant

9.122 The magnitude of impact and significance of effects associated with the long-term changes in traffic are provided in Table 9. 19.

Table 9. 19 – Long term noise impact, non-project scenario, DMCY - DMBY

Receptor	Heights	Change in level (dB)	Magnitude of impact	Significance of effect
Chidswell Lane receiver	1.5 m	1.1	Negligible	Not significant
Leeds Road receiver	1.5 m	1.1	Negligible	Not significant
Heybeck Lane receiver	1.5 m	1.1	Negligible	Not significant

9.123 Overall, the magnitude of impact at the Leeds Road receiver and Heybeck Lane receiver would be negligible and not significant for the long term changes. The magnitude of impact at the Chidswell Lane receiver would be minor and not significant.

9.124 During the operational phase, the change of traffic flow does not have significant impact on the existing receptors. Therefore, additional mitigation measures are not required.

9.125 The noise within the Site is also predicted based on the traffic from the existing roads, however, the noise levels at specific buildings within the Site is not possible to calculate at this stage. Therefore, no further assessment is considered in this chapter. To guarantee a good acoustic environment within the Site, noise limits can be set as planning conditions.

Operational Noise – Building Services

9.126 At this stage, there are no details of the building services which are likely to be included within the school or commercial buildings within the local centre or within the employment area.

9.127 If the noise from plant is controlled, such that the rating level is no more than the prevailing background noise levels, the impact magnitude is low and the effects would be minor adverse.

9.128 Noise limits can be set as planning conditions and attenuation applied to the equipment.

Operational Noise – School activities

9.129 School activity noise can include outdoor playground, outdoor teaching and sports, music and musical performances.

9.130 At this stage, there are no details of the school, or external play areas.

9.131 The likely activities are normal sounds within a suburban environment and most schools are located within residential areas.

9.132 The absolute levels of the noise from the activities can be predicted when details are available and mitigation can be introduced in the form of fencing or bunding if required.

9.133 If the noise levels from the school activities are less than 50dB $L_{Aeq,10hr}$ the magnitude of impact will be low and the effects would be minor adverse.

Cumulative effects

9.134 Cumulative effects of increases in traffic from other nearby developments has been included within the traffic data provided.

9.135 The 2030 traffic data includes traffic from the Applicant's Heybeck Lane site to the immediate north of the Site and the proposed Barratt Homes scheme for 252 dwellings, to the south-west of the Site, to enable cumulative impacts to be assessed.

9.136 The effects due to impacts from different activities for example, due to activity noise from the development and construction noise, will not occur at the same time periods and therefore will not be cumulative.

9.137 The effects from increases in traffic and from construction may occur at the same time periods, but the receptors would not be the same for each noise source.

9.138 The receptors exposed to the greatest construction noise would be facing into the Site, whereas the greatest effects from changes in traffic are for the buildings facing onto the existing roads.

Mitigation

9.139 The key objective of mitigation is to avoid, offset or reduce the significant adverse effects of the development.

9.140 The mitigation strategy should follow the following hierarchy:

- Avoid
- Reduce
- Remedy

9.141 Mitigation can be carried out through design or management, the latter being often considered separately for construction and operation.

Construction noise – mitigation

9.142 Site Access 5 should not be used as the route for construction vehicles.

9.143 Fixed plant associated with the construction activities could be located away from the sensitive receptors and shielded from the receptors with bunds.

9.144 A range of good site practices will be adopted by the contractor in order to mitigate construction phase noise and vibration. It is assumed that the contractor will follow best practicable means to reduce the noise and vibration impact on the local community, including:

- fixed and semi-fixed ancillary plant such as generators, compressors etc. which can be located away from receptors to be positioned to cause minimum noise disturbance. If necessary, acoustic barriers or enclosures to be provided for specific items of fixed plant;
- if necessary, use of site boundary acoustic barriers/hoarding to screen neighbouring receptors;
- all plant used on site will comply with the EC Directive on Noise Emissions for Outdoor Equipment (2000/14/EC), where applicable;
- operation of plant in accordance with the manufacturer's instructions;

- selection of inherently quiet plant where appropriate. All major compressors to be 'sound reduced' models fitted with properly lined and sealed acoustic covers which are kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools to be fitted with mufflers or silencers of the type recommended by the manufacturers;
- all plant used on site will be regularly maintained, paying attention to the integrity of silencers and acoustic enclosures;
- machines in intermittent use to be shut down in the intervening periods between work or throttled down to a minimum;
- drop heights of materials from lorries and other plant will be kept to a minimum;
- adherence to the codes of practice for construction working and piling given in BS 5228:2009+A1:2014 and the guidance given therein for minimising noise and vibration emissions from the site;
- provision of rest periods during any prolonged noisy activities;
- prohibition of the use of stereos and radios on site;
- compliance with the Councils preferred working hours of 08:00-18:00 Monday to Friday, 08:00-13:00 on Saturdays, with no working on Sundays or bank holidays; and
- keeping local residents informed and provision of a contact name and number for any queries or complaints.

9.145 The construction management plans are likely to be required as part of the planning conditions for the development and the details of the construction activities can be included within these, for each stage of the development.

9.146 With the mitigation in place the noise levels at receptors may still exceed the levels considered to be significant, but the best practical means mitigation will ensure that it will be a short term and temporary effect. Therefore, when considered as a temporary effect noise effects on individual receptors with mitigation would be not significant.

Construction – vibration

9.147 The effects from vibration should be mitigated by maintaining a separation distance between the receptors and the areas being compacted of 20m or more. If this is not practical other temporary mitigation may be required, such as alternative methods of compaction, or undertaking the work at an agreed time with the residents at the nearby receptors.

9.148 Other mitigation requirements for vibration would include the same best practice as applied for construction and importantly should include advising receptors of times when these activities will occur.

9.149 With the mitigation in place the effects of the vibration levels on nearby residential receptors would be not significant.

Operational

9.150 To reduce the effects of the noise on the residential buildings within the Site, a proper façade acoustic design should be carried out. Planning conditions may be addressed to ensure a good acoustic environment to be achieve.

9.151 The detailed mitigation for the other operational activities will need to be developed as the designs progress and can be managed using planning conditions for the reserved matters submissions.

9.152 Based on the traffic flow data, the noise impact on the existing receptors due to change of traffic flow is not significant, therefore, no further noise mitigation measures are considered.

Residual effect

9.153 Should the above mitigation be put in place during the construction and operation phases of the proposed development, the residual significance of effects on the receptors have been assessed as set out in Table 9. 20 below.

Table 9. 20 – Residual effect

Significance of effects	Receptors	Pre-mitigation Significance	Mitigation	Residual Effect
Construction Phase (Temporary)				
Noise effects at high sensitive receptors during nearest construction works or high noise events, e.g. piling	Existing residential receptors and new residential receptors built in earlier phase	Significant	Standard best practice measures as shown in Paragraph 9.142 to 9.146	Not Significant
Vibration effects at high sensitivity receptors during nearest construction works or high noise events, e.g. piling		Significant	Standard best practice measures as shown in Paragraph 9.147 to 9.149	Not Significant
Operational Phase (long term / permanent)				
Road traffic noise from existing roads impact on the high sensitive receptors	Existing residential receptors on Chidswell Lane	Not significant	No further mitigation required	Not Significant
Road traffic noise from existing and proposed roads on the high sensitive receptors	New residential receptors, Primary School buildings, Local Centre and Employment Areas	Not significant	Planning conditions to ensure a good acoustic design as shown in 9.150 and 9.151.	Not Significant

Statement of Significance

9.154 The effect of the construction noise levels following mitigation may be significant for some receptors, but it would be a temporary effect during some construction activities closest to the receptors. However, these will occur for a relatively short period of time, compared to the total construction period and are therefore not considered significant.

9.155 The temporary nature of the effect from construction noise and considering that the impact on the receptors is during the daytime only, results in an overall effect that is not significant.

9.156 The effects of the construction vibration levels are not significant.

9.157 The effects of the operation of the completed development are not significant.

Summary

9.158 The purpose of this noise and vibration chapter is to identify the potential noise and vibration impact on the existing and future noise sensitive receptors from the construction and operational phases of the Proposed Development.

- 9.159 In this chapter, the following key elements are addressed: the assessment methodology, the baseline noise conditions, assessment of noise and vibration impact, potential mitigation measures and the residual effects.
- 9.160 The assessment methodology is referred to the latest national and local guidance for environment impact assessment and planning. The Local Environmental Protection team was also consulted. The comments from the Environmental Health Officer has been adopted in this chapter.
- 9.161 A desktop study was carried out to identify the existing noise sensitive receptors and the affected roads to establish the baseline noise survey positions.
- 9.162 The baseline noise conditions were measured around the boundary of the Proposed Development and at various positions close to the affected existing roads. The baseline noise measurements indicate that the existing noise sensitive receptors are exposed to relative high noise levels from road traffic and the existing noise environment within the Site is at a risk between negligible and low.
- 9.163 Construction noise and vibration impact cannot be accurately predicted at this stage. However, they could cause significant adverse effect without appropriate mitigation.
- 9.164 Road traffic noise and vibration impact on the existing noise sensitive receptors during operational phase is not significant.
- 9.165 Noise impact from building services and school activities are assessed and appropriate noise limits are proposed to avoid significant noise effect.
- 9.166 To mitigate the effects of construction activities, best practical means to minimise the noise and vibration impacts must be adopted.
- 9.167 For noise from building services and school activities, detailed mitigation can be provided with the reserved matters applications. For impact on the new noise sensitive receptors within the Site, planning conditions with appropriate noise requirements can be provided.
- 9.168 Residual noise and vibration effects on the existing and new noise and vibration sensitive receptors would not be significant with the implementation of the mitigation measures described.

References

The Town and Country Planning (Environmental Impact Assessment) Regulations (EIA, 2017 Regulations);

National Planning Policy Framework (NPPF, 2019);

Noise Policy Statement for England (NPSE, 2010);

Planning Practice Guidance (PPG, 2019);

Guidance for Environmental Noise Impact Assessment, Institute of Environmental Management and Assessment (IEMA 2014)

British Standard 8233:2014: Sound Insulation and Noise Reduction for Buildings (BS 8233, 2014);

Design Manual for Roads and Bridges (DMRB, 2019);

Calculation of Road Traffic Noise (CRTN, 1988);

British Standard 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites (BS 5288-1, 5288-2, 2014);

British Standard 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound (BS 4142, 2019);

British Standard 7385 Part 2: Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration' (BS 7385-2, 1993);

British Standard 6472-1 'Guide to evaluation of human exposure to vibration in buildings' (6472-1, 2008);

West Yorkshire Planning Consultation Guidance – Noise & Vibration.

10 Air Quality

Introduction

- 10.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development with respect to Air Quality. This includes consideration of potential fugitive dust emissions associated with construction works and road traffic exhaust emissions from vehicles travelling to and from the Site during the operational phase, as well as potential exposure of future occupants to existing air quality issues. This Chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 10.2 This Chapter has been completed by Delta-Simons approved technical specialist Redmore Environmental Ltd, with the reviewer having over ten years' experience in air quality, being a Full Member of the Institute of Air Quality Management (IAQM) and Institute of Environmental Science (IES).
- 10.3 This Chapter should be read with reference to the following Figures and Appendices:
- Figure 10.1 - Monitoring Locations;
 - Figure 10.2 - Road Vehicle Exhaust Emission Sensitive Receptor Locations;
 - Figure 10.3 - Predicted Annual Mean NO₂ Concentrations (µg/m³);
 - Figure 10.4 - Predicted Annual Mean PM₁₀ Concentrations (µg/m³);
 - Figure 10.5 - ADMS-Roads Inputs;
 - Figure 10.6 - Wind Rose of 2018 Leeds Bradford International Airport Meteorological Data;
 - Appendix 10.1 - Construction Phase Assessment Methodology;
 - Appendix 10.2 - Dispersion Modelling Input Parameters; and,
 - Appendix 10.3 - Dispersion Modelling Results.

Legislative and Policy Context

UK Legislation

- 10.4 The Air Quality Standards Regulations (2010) came into force on 11th June 2010 and include Air Quality Limit Values (AQLVs) for the following pollutants:
- Nitrogen dioxide (NO₂);
 - Sulphur dioxide;
 - Lead;
 - Particulate matter with an aerodynamic diameter of less than 10µm (PM₁₀);
 - Particulate matter with an aerodynamic diameter of less than 2.5µm;
 - Benzene; and,
 - Carbon monoxide.

- 10.5 Target Values were also provided for an additional 5 pollutants. These include:
- Ozone;

- Arsenic;
- Cadmium;
- Nickel; and,
- Benzo(a)pyrene.

10.6 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007²⁹. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

10.7 Table 10.1 presents the AQOs for pollutants considered within this Chapter.

Table 10.1 - Air Quality Objectives

Pollutant	Air Quality Objective	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Period
NO ₂	40	Annual mean.
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum.
PM ₁₀	40	Annual mean.
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum.

10.8 Table 10.2 summarises the advice provided in DEFRA guidance³⁰ on where the AQOs for the pollutants considered within this report apply.

Table 10.2 - Examples of Where the Air Quality Objectives Apply

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-hour mean	All locations where the annual mean objective would apply, together with hotels Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might	Kerbside sites where the public would not be expected to have regular access

²⁹ The AQS for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

³⁰ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

Averaging Period	Objective Should Apply At	Objective Should Not Apply At
	reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	

Local Air Quality Management

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

Dust

10.10 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2016) as amended, such as construction sites, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

"any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

10.11 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the authority is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). Enforcement can insist that there be no dust beyond the boundary of the works. The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practice measures.

National Planning Policy

10.12 The revised National Planning Policy Framework³¹ (NPPF) was last published in June 2019 and sets out the Government's planning policies for England and how these are expected to be applied.

10.13 Chapter 15 of the NPPF details objectives in relation to conserving and enhancing the natural environment. It states that:

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

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality [...]"

10.14 The NPPF specifically recognises air quality as part of delivering sustainable development and states that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of

³¹ NPPF, Ministry of Housing, Communities and Local Government, 2019.

Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

10.15 The implications of the NPPF have been considered throughout the undertaking of this Chapter.

National Planning Practice Guidance

10.16 The National Planning Practice Guidance³² (NPPG) web-based resource was launched by the Department for Communities and Local Government on 6th March 2014 to support the NPPF and make it more accessible. The air quality pages were reviewed and the relevant guidance considered as necessary throughout the undertaking of the assessment.

Local Planning Policy

10.17 The Kirklees Local Plan (KLP)³³ was adopted by Kirklees Metropolitan District Council (KMDC) on 27th February 2019. The KLP sets out the spatial vision and strategy for the development of Kirklees for the period up to 2031 and is used to guide decisions on planning, development and regeneration. Policies LP47 and LP51 are of relevance to this assessment and were therefore considered as necessary.

Assessment Methodology

Construction Phase

10.18 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction V1.1'³⁴.

10.19 Activities on the proposed construction Site have been divided into three types to reflect their different potential impacts. These are:

- Earthworks;
- Construction; and,
- Trackout.

10.20 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance by dust soiling as a result of deposition;
- Harm to ecological receptors; and,
- The risk of health effects due to a significant increase in exposure to PM₁₀:

10.21 The dust emission magnitude for each activity and the sensitivity of the area to dust soiling, ecological and human health impacts was determined. These factors were combined to determine the impact significance of unmitigated effects. Once derived, Site specific mitigation

³² <http://planningguidance.planningportal.gov.uk>.

³³ KLP, KMDC, 2019.

³⁴ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

proportionate to the level of impact was identified and the significance of residual effects determined. This is discussed further in the Significance Criteria Section.

10.22 Reference should be made to Appendix 10.1 for details of the IAQM methodology³⁵ used to assess construction dust impacts.

Operational Phase

10.23 The Proposed Development has the potential to affect existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the Site, as well as expose future occupants to poor air quality. Potential impacts have therefore been defined by predicting pollutant concentrations at sensitive locations using dispersion modelling for the following scenarios:

- 2018 - Verification;
- Opening year Do-Minimum (DM) (predicted traffic flows in 2030 should the Proposed Development not proceed); and;
- Opening year Do-Something (DS) (predicted traffic flows in 2030 should the Proposed Development be completed).

10.24 It should be noted that the DS scenario considers impacts prior to the implementation of any operational phase mitigation.

10.25 Reference should be made to Appendix 10.2 for details of the dispersion modelling input parameters.

Potential Development Impacts

10.26 It is noted above, the Proposed Development has the potential to impact on existing air quality as a result of road traffic exhaust emissions associated with vehicles travelling to and from the Site. Locations sensitive to potential changes in pollutant concentrations were identified within 200m of the highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)³⁶ on the likely limits of pollutant dispersion from road sources. The criteria provided within DEFRA guidance³⁷ on where the AQOs apply, as summarised in Table 10.2, was utilised to determine worst-case receptor positions in the vicinity of links likely to be affected by changes in traffic flows as a result of the Proposed Development.

10.27 The magnitude of impact from road traffic exhaust emissions was categorised based on the predicted concentration change between the DM and DS scenarios as a proportion of the AQO. This is outlined in Table 10.3. It should be noted these are based on the values provided within the IAQM guidance³⁸ with additional descriptors to ensure consistency throughout the ES.

Table 10.3 - Operational Phase - Impact Magnitude

Magnitude of Impact	Predicted Concentration Change as a Proportion of AQO (%)
Major	Greater than 10
Moderate	6 - 10
Minor	2 - 5
Very Minor	1
Negligible	0

³⁵ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

³⁶ DMRB Volume 11, Section 3, Part 1, HA207/07, Highways Agency, 2007.

³⁷ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2016.

³⁸ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

10.28 It should be noted that the categories shown in Table 10.3 are intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which makes it clearer which cell the impact falls within. It should be noted that a change of 0%, i.e. less than 0.5% are described as **negligible**.

10.29 The sensitivity of receptors to potential changes in pollutant concentrations as a result of road vehicle exhaust emissions is outlined in Table 10.4. It should be noted these are based on the values provided within the IAQM guidance³⁹ with additional descriptors to ensure consistency throughout the ES.

Table 10.4 - Operational Phase - Sensitivity of Receptor to Changes in Pollutant Concentrations

Receptor Sensitivity	Pollutant Concentration at Receptor in Assessment Year (% of AQO)
Very High	110% or more of AQO
High	103 - 109% of AQO
Moderate	95 - 102% of AQO
Low	76 - 94% of AQO
Very Low	75% or less of AQO

10.30 The significance of impact is determined by the interaction between the sensitivity of the receptor and the magnitude of impact. This is explained in the Significance Criteria Section.

Future Exposure

10.31 The Proposed Development has the potential to expose future occupants to poor air quality. Pollutant concentrations in the future were therefore quantified across the Site using dispersion modelling. The results were subsequently compared with the relevant AQOs to determine the potential for any exceedence.

Significance Criteria

Construction Phase

10.32 The significance of unmitigated construction dust impacts was determined in accordance with the IAQM methodology⁴⁰ provided in Appendix 10.1.

10.33 It should be noted that all construction dust impacts are classified as adverse as they relate to a deterioration in baseline air quality.

10.34 Site specific mitigation measures were then identified from the recommendations outlined within the IAQM guidance⁴¹ to reduce potential impacts based on the predicted significance.

10.35 The significance of residual impacts was subsequently determined based on likely effectiveness of the identified mitigation measures. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible, hence the residual effect will normally be **not significant** with regard to the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

³⁹ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

⁴⁰ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

⁴¹ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Operational Phase

10.36 The interaction between the magnitude of impact and sensitivity of the receptor was utilised to define the significance of the effect as a result of operational phase road vehicle exhaust emissions, as outlined in Table 10.5.

Table 10.5 - Operational Phase - Effect Significance

Impact Magnitude	Receptor Sensitivity				
	Very High	High	Moderate	Low	Very Low
Major	Major Adverse/ Beneficial	Major Adverse/ Beneficial	Major Adverse/ Beneficial	Moderate Adverse/ Beneficial	Moderate Adverse/ Beneficial
Moderate	Major Adverse/ Beneficial	Major Adverse/ Beneficial	Moderate Adverse/ Beneficial	Moderate Adverse/ Beneficial	Minor Adverse/ Beneficial
Minor	Major Adverse/ Beneficial	Moderate Adverse/ Beneficial	Moderate Adverse/ Beneficial	Minor Adverse/ Beneficial	Negligible
Very Minor	Moderate Adverse/ Beneficial	Moderate Adverse/ Beneficial	Minor Adverse/ Beneficial	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

10.37 Following the prediction of impacts at discrete receptor locations, the IAQM document⁴² provides guidance on determining the overall air quality effect significance of the operation of a development. The following factors are identified for consideration by the assessor.

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and;
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts.

10.38 The IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. Where the overall impact is **moderate** or **major**, the effect is likely to be considered **significant**, whilst if the impact is **minor** or **negligible**, the effect is likely to be considered **not significant** with regard to the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

Limitations and Assumptions

10.39 In undertaking the air quality assessment there are a number of limitations and constraints affecting the outputs from this work. These include the following assumptions:

- The meteorological data used for the assessment is representative of the conditions at the Site;
- The background concentrations used for the assessment are representative of baseline annual mean pollutant concentrations at the Site and surrounding area;
- The traffic data obtained for the purpose of the assessment is accurate;
- The road widths and speeds applied to the traffic data are accurate;
- The emission factors used in the assessment of operational phase road traffic vehicle exhaust emissions are representative;
- The monitoring data used in the assessment was accurate; and,

⁴² Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

- The length of unpaved roads on Site during the construction phase will be greater than 100m.

10.40 The above assumptions must be adopted for any project of this nature. As such, they are not considered to have significantly affected the conclusions of the assessment.

Baseline Conditions

10.41 Existing air quality conditions in the vicinity of the Proposed Development were identified in order to provide a baseline for assessment.

Local Air Quality Management

10.42 As required by the Environment Act (1995), KMDC has undertaken review and assessment of air quality within their area of jurisdiction. This process has indicated that annual mean concentrations of NO₂ and 24-hour mean PM₁₀ concentrations are above the AQOs within the borough. As such, nine AQMAs have been declared. The closest to the Site is Kirklees AQMA 5, which was declared due to exceedences of the annual mean NO₂ AQO and is described as follows.

"The designated area incorporates Leeds Road (A653), Dewsbury Ring Road (A638), Wakefield Road (A638), Highgate Road, Highgate Terrace, Bank Street and Old Bank Road, which is in close proximity to Dewsbury Town Centre."

10.43 The site is located approximately 1.9km north-east of the AQMA. As such, there is the potential for vehicles travelling to and from the Site to increase pollution levels in this sensitive area. This has been considered throughout the assessment.

10.44 KMDC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

Air Quality Monitoring

10.45 Monitoring of pollutant concentrations is undertaken by KMDC throughout their area of jurisdiction. Recent results recorded in the vicinity of the Proposed Development are shown in Table 10.6. Exceedences of the relevant AQO of 40µg/m³ are shown in **bold**.

Table 10.6 - Monitoring Results - KMDC

Monitoring Site		Monitored Annual Mean NO ₂ Concentration (µg/m ³)		
		2016	2017	2018
4	Princess Street, Batley	32.68	25.20	28.47
20	Rockley Street, Dewsbury	36.20	35.69	33.96
39	Bradford Road, Batley	39.30	36.41	30.47
40	Leeds Road, Dewsbury	54.40	53.44	52.40
42	Leeds Road, Dewsbury - 2	43.60	45.94	39.60
43	John Street, Dewsbury	43.00	38.59	42.93
44	Calmswood Road, Eastborough	32.20	34.44	35.07
54	Wakefield Road, Dewsbury	39.00	35.00	33.87

10.46 As shown in Table 10.6, annual mean NO₂ concentrations were above the AQO at several sites between 2016 and 2018. As the monitors are positioned at roadside locations, exceedences would be expected.

10.47 The Proposed Development is located approximately 530m south of Leeds City Council's (LCC's) administrative boundary. LCC also undertake monitoring of pollutant concentrations in the vicinity of the Site. Recent results are shown in Table 10.7.

Table 10.7 - Monitoring Results - LCC

Monitoring Site		Monitored Annual Mean NO ₂ Concentration (µg/m ³)		
		2016	2017	2018
D151	2 Bradford Road	30	32	28
D153	3 Oban Terrace	34	30	29
D154	The Brambles, Bradford Road	36	31	28

10.48 As shown in Table 10.7, annual mean NO₂ concentrations were below the AQO at all LCC monitoring sites during recent years.

10.49 KMDC and LCC do not undertake PM₁₀ monitoring within the vicinity of the Site.

10.50 Reference should be made to Figure 10.1 for a map of the survey positions.

Background Pollutant Concentrations

10.51 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA. These maps cover the entirety of the UK to assist LAs in their Review and Assessment of air quality. The Proposed Development is partially located in seven grid squares. Data for these locations was downloaded from the DEFRA website⁴³ for the purpose of the project. This data is summarised in Table 10.8.

Table 10.8 - Background Pollutant Concentrations

NGR (m)	Predicted Background Annual Mean Pollutant Concentration (µg/m ³)					
	NO ₂			PM ₁₀		
	2018	2020	2030	2018	2020	2030
426500, 424500	14.82	13.64	10.69	14.07	13.88	13.49
426500, 423500	15.34	14.16	11.16	12.14	11.88	11.50
427500, 423500	13.39	12.35	9.74	12.43	12.17	11.78
426500, 422500	15.68	14.49	11.52	11.90	11.65	11.32
427500, 424500	13.93	12.82	9.95	11.95	11.69	11.28
428500, 423500	13.07	12.04	9.34	12.49	12.23	11.83
427500, 422500	14.38	13.25	10.35	12.13	11.87	11.48

10.52 As shown in Table 10.8, predicted background NO₂ and PM₁₀ concentrations are below the relevant AQOs at the Site.

Sensitive Receptors

10.53 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for dust and road vehicle exhaust emission impacts in the following Sections.

Construction Phase

10.54 In accordance with the IAQM methodology⁴⁴, an assessment is undertaken where there are: 'human receptors' within 350m of the Site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance(s); and/or

⁴³ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017>.

⁴⁴ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

'ecological receptors' within 50m of the Site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance(s).

10.55 A desk-top study was undertaken to identify locations sensitive to potential dust impacts within the above assessment zones. This identified the following:

- There are greater than 100 human receptors within 350m of the Site boundary. The closest of these are situated to the west, south-west and south of the Proposed Development, along Leeds Road, Willerton Close, Manor Park and Chidswell Lane, and include residential properties.
- There are greater than 100 human receptors within 50m of the route(s) that may be used by construction vehicles on the public highway, up to 500m from the Site entrance (s). The closest of these are situated adjacent to Leeds Road and Chidswell Lane, to the west and south of the Proposed Development, respectively, and include residential properties.
- There are two ecological receptors within 50m of the Site Boundary. These include the Dum Wood Local Wildlife Site (LWS) and Site of Wildlife Significance (SWS) and Dogloitch Wood LWS and SWS, which lie approximately 20m to the north and east, respectively.
- There are two ecological receptors within 50m of the route(s) that may be used by construction vehicles on the public highway, up to 500m from the Site entrance (s). These include the Scargill Wood LWS and SWS and Soothill Wood LWS, which lie approximately 70m and 230m to the north and north-west, respectively.

Operational Phase

10.56 Locations sensitive to potential operational phase road vehicle exhaust emission impacts were identified from a desk-top study and are summarised in Table 10.9.

10.9 - Operational Phase Road Vehicle Exhaust Emission Sensitive Receptor Locations

Receptor		NGR (m)	
		X	Y
R1	Residential - Oban Close	427907.9	426244.7
R2	Residential - Tingley Hall Rise	428081.2	426212.0
R3	Residential - Bradford Road	428202.8	426158.2
R4	Residential - Station Hall Farm	428286.2	426511.2
R5	Residential - Tingley Avenue	428231.3	426245.9
R6	Residential - Bradford Road	428416.5	426113.0
R7	Education Facility - Bradford Road	428730.0	425969.2
R8	Residential - Aspen Court	427230.4	426233.5
R9	Residential - Dewsbury Road	427798.9	425878.5
R10	Residential - Dewsbury Road	427525.3	425509.0
R11	Residential - Dewsbury Road	427520.6	425558.2
R12	Education Facility - Rein Road	427349.3	425973.8
R13	Residential - Rein Road	427309.0	425893.0
R14	Residential - Dewsbury Road	427080.4	424948.5
R15	Residential - Leeds Road	426911.1	424429.4
R16	Residential - Leeds Road	426933.0	424515.4
R17	Residential - Heybeck Lane	426958.7	424461.8
R18	Residential - Leeds Road	426825.9	424213.6
R19	Residential - Leeds Road	426539.7	423364.2
R20	Residential - Leeds Road	426695.0	423769.2
R21	Residential - Leeds Road	426379.2	423194.0

Receptor		NGR (m)	
		X	Y
R22	Residential - Leeds Road	426264.3	423097.6
R23	Residential - Leeds Road	426212.5	423094.5
R24	Residential - Leeds Road	426103.4	423016.3
R25	Residential - Leeds Road	425836.5	422793.2
R26	Residential - Leeds Road	425457.3	422393.2
R27	Residential - Leeds Road	425084.7	422014.8
R28	Residential - Leeds Road	424983.9	422015.4
R29	Residential - Leeds Road	424921.0	421978.3
R30	Residential - Leeds Road	424864.7	421922.8
R31	Education Facility - Leeds Road	424834.4	421903.6
R32	Residential - Highgate Road	424856.2	421830.7
R33	Residential - Highgate Road	424895.1	421778.2
R34	Residential - Soothill Lane	426235.3	424361.1
R35	Residential - Soothill Lane	425652.9	424244.5
R36	Residential - Grange Road	425420.5	423707.8
R37	Education Facility- Soothill Lane	425908.2	424167.8
R38	Residential - Heybeck Lane	427092.5	424408.5
R39	Residential - Heybeck Lane	427237.1	424477.2
R40	Education Facility - Heybeck Lane	428016.8	424506.5
R41	Residential - Chidswell Lane	426656.5	422999.9
R42	Residential - Windsor Drive	426400.2	422827.6
R43	Residential - Owl Lane	426540.6	422534.7
R44	Residential - Owl Lane	426938.3	422099.4
R45	Residential - Chidswell Lane	426777.9	422730.7
R46	Residential - Kingsway	427114.7	421851.0
R47	Residential - Kingsway	427210.8	421709.2
R48	Education Facility - Leeds Road	427149.1	422033.2
R49	Residential - Lodge Hill Road	427767.9	421856.3
R50	Residential - Cross Keys	429391.9	420986.1
R51	Residential - Wakefield Road	429763.4	420720.4
R52	Residential - Batley Road	429537.1	422953.5

10.57 Reference should be made to Figure 10.2 for a graphical representation of road vehicle exhaust emission sensitive receptor locations.

Identification and Evaluation of Likely Significant Effects

10.58 There is the potential for air quality impacts as a result of the construction and operation of the Proposed Development. These are assessed in the following Sections.

Construction Phase

Step 1 - Screening the Requirement for a Detailed Assessment

10.59 The undertaking of activities such as excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions

throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul roads and highway surfaces.

10.60 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

10.61 The desk-top study undertaken to inform the baseline identified a number of sensitive receptors within 350m from the Site boundary. As such, a detailed assessment of potential dust impacts was required.

Step 2A - Construction Dust Emission Magnitude

10.62 The IAQM methodology⁴⁵, provided in Appendix 10.1, was utilised to determine the potential dust emission magnitude as a result of the following construction activities.

Earthworks

10.63 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. While the development is likely to be phased, in order to represent a worst-case assessment scenario, the whole Site was considered to be developed in parcels of greater than 10,000m². The magnitude of potential dust emissions from earthworks is therefore **major**.

Construction

10.64 Due to the size of the Proposed Development the total building volume is likely to be greater than 100,000m³. The magnitude of potential dust emissions from construction is therefore **major**.

Trackout

10.65 Based on the Site area, it is anticipated that the unpaved road length may be greater than 100m. The magnitude of potential dust emissions from trackout activities is therefore **major**.

10.66 The dust emission magnitude for each activity is summarised in Table 10.10.

Table 10.10 - Construction Dust Emission Magnitude Summary

Activity	Dust Emission Magnitude
Earthworks	Major
Construction	Major
Trackout	Major

Step 2B - Construction Dust Receptor Sensitivity

10.67 In accordance with the IAQM guidance⁴⁶, the sensitivity of the receiving environment to potential dust soiling and human health impacts was determined as **high**. This was because the receptors identified during the baseline study included residential properties.

10.68 The sensitivity of the receiving environment to potential ecological impacts was determined as **low**. This was because the receptors identified during the baseline study comprised locally designated sites.

⁴⁵ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

⁴⁶ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

10.69 The sensitivity of the receiving environment to potential dust impacts is shown in Table 10.11.

Table 10.11 - Sensitivity of the Surrounding Area to Construction Dust Impacts

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling	High	High	High
Human Health	Low	Low	Moderate
Ecological	Low	Low	Low

10.70 As shown in Table 10.11, the sensitivity of the surrounding area to dust soiling impacts is **high** for earthworks, construction and trackout. The sensitivity of the surrounding area to human health impacts is **low** for earthworks and construction and **moderate** for trackout. The sensitivity of the surrounding area to ecological impacts is **low** for earthworks, construction and trackout.

Step 2C - Construction Dust Unmitigated Effect Significance

10.71 The dust emission magnitude and sensitivity of the area to dust impacts, summarised in Table 10 and Table 11, respectively, were combined in accordance with the IAQM methodology⁴⁷, as shown in Appendix 10.1, in order to determine the effect significance of unmitigated impacts. This is summarised in Table 10.12.

Table 10.12 - Summary of Potential Unmitigated Construction Dust Effect Significance

Potential Impact	Unmitigated Dust Emission Effect		
	Earthworks	Construction	Trackout
Dust Soiling	Major	Major	Major
Human Health	Minor	Minor	Moderate
Ecological	Minor	Minor	Minor

10.72 As indicated in Table 10.12, the unmitigated dust soiling effects are predicted to be **major adverse** from earthworks, construction and trackout. The unmitigated human health effects are predicted to be **moderate adverse** from trackout and **minor adverse** from earthworks and construction. The unmitigated ecological effects are predicted to be **minor adverse** from earthworks, construction and trackout. These effects are considered to be **long term** (greater than one year), **temporary** and **local**.

Operational Phase

10.73 Vehicle movements associated with the operation of the Proposed Development will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the Site.

10.74 The assessment considered the following scenarios:

- 2018 - Verification;
- 2030 - DM; and,

⁴⁷ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

- 2030 - DS.

10.75 The DM scenario (i.e. without development) represented anticipated baseline traffic data, inclusive of anticipated growth and committed developments, for the relevant assessment year. The DS scenario (i.e. with development) represented anticipated baseline traffic data, inclusive of anticipated growth and committed developments, for the relevant assessment year, in addition to predicted vehicle trips associated with the operation of the Proposed Development.

10.76 Reference should be made to Appendix 10.2 for full assessment input details.

Potential Development Impacts

Nitrogen Dioxide

10.77 Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios and are shown in Appendix 10.3.

10.78 Predicted unmitigated effects on annual mean NO₂ concentrations at the sensitive receptor locations are summarised in Table 10.13.

10.13 - Predicted Unmitigated Effect Significance - Annual Mean NO₂ Concentrations

Receptor		Sensitivity	Impact Magnitude	Unmitigated Effect Significance
R1	Residential - Oban Close	Very Low	Negligible	Negligible
R2	Residential - Tingley Hall Rise	Very Low	Very Minor	Negligible
R3	Residential - Bradford Road	Very Low	Negligible	Negligible
R4	Residential - Station Hall Farm	Very Low	Negligible	Negligible
R5	Residential - Tingley Avenue	Very Low	Negligible	Negligible
R6	Residential - Bradford Road	Very Low	Negligible	Negligible
R7	Education Facility - Bradford Road	Very Low	Negligible	Negligible
R8	Residential - Aspen Court	Very Low	Negligible	Negligible
R9	Residential - Dewsbury Road	Very Low	Minor	Negligible
R10	Residential - Dewsbury Road	Very Low	Minor	Negligible
R11	Residential - Dewsbury Road	Very Low	Minor	Negligible
R12	Education Facility - Rein Road	Very Low	Negligible	Negligible
R13	Residential - Rein Road	Very Low	Negligible	Negligible
R14	Residential - Dewsbury Road	Very Low	Minor	Negligible
R15	Residential - Leeds Road	Very Low	Minor	Negligible
R16	Residential - Leeds Road	Very Low	Minor	Negligible
R17	Residential - Heybeck Lane	Very Low	Minor	Negligible
R18	Residential - Leeds Road	Very Low	Minor	Negligible
R19	Residential - Leeds Road	Very Low	Minor	Negligible
R20	Residential - Leeds Road	Very Low	Minor	Negligible
R21	Residential - Leeds Road	Very Low	Minor	Negligible
R22	Residential - Leeds Road	Very Low	Minor	Negligible
R23	Residential - Leeds Road	Very Low	Minor	Negligible
R24	Residential - Leeds Road	Very Low	Minor	Negligible
R25	Residential - Leeds Road	Very Low	Minor	Negligible
R26	Residential - Leeds Road	Very Low	Minor	Negligible
R27	Residential - Leeds Road	Very Low	Minor	Negligible

Receptor		Sensitivity	Impact Magnitude	Unmitigated Effect Significance
R28	Residential - Leeds Road	Very Low	Minor	Negligible
R29	Residential - Leeds Road	Low	Moderate	Moderate Adverse
R30	Residential - Leeds Road	Low	Moderate	Moderate Adverse
R31	Education Facility - Leeds Road	Very Low	Minor	Negligible
R32	Residential - Highgate Road	Very Low	Very Minor	Negligible
R33	Residential - Highgate Road	Very Low	Very Minor	Negligible
R34	Residential - Soothill Lane	Very Low	Very Minor	Negligible
R35	Residential - Soothill Lane	Very Low	Very Minor	Negligible
R36	Residential - Grange Road	Very Low	Very Minor	Negligible
R37	Education Facility- Soothill Lane	Very Low	Negligible	Negligible
R38	Residential - Heybeck Lane	Very Low	Very Minor	Negligible
R39	Residential - Heybeck Lane	Very Low	Negligible	Negligible
R40	Education Facility - Heybeck Lane	Very Low	Negligible	Negligible
R41	Residential - Chidswell Lane	Very Low	Very Minor	Negligible
R42	Residential - Windsor Drive	Very Low	Very Minor	Negligible
R43	Residential - Owl Lane	Very Low	Very Minor	Negligible
R44	Residential - Owl Lane	Very Low	Minor	Negligible
R45	Residential - Chidswell Lane	Very Low	Negligible	Negligible
R46	Residential - Kingsway	Very Low	Very Minor	Negligible
R47	Residential - Kingsway	Very Low	Negligible	Negligible
R48	Education Facility - Leeds Road	Very Low	Very Minor	Negligible
R49	Residential - Lodge Hill Road	Very Low	Very Minor	Negligible
R50	Residential - Cross Keys	Very Low	Negligible	Negligible
R51	Residential - Wakefield Road	Very Low	Negligible	Negligible
R52	Residential - Batley Road	Very Low	Negligible	Negligible

10.79 As indicated in Table 10.13, unmitigated effects on annual mean NO₂ concentrations as a result of the Proposed Development were predicted to be **moderate adverse** at two receptors, R29 and R30, and **negligible** at the remaining 50 locations. These effects are considered to be **long term, permanent** and **local**.

10.80 It should be noted that positions R29 and R30 are situated adjacent to the portion of Leeds Road included within Kirklees AQMA 5.

Particulate Matter

10.81 Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the DM and DS scenarios and are shown in Appendix 10.3.

10.82 Predicted unmitigated effects on annual mean PM₁₀ concentrations at the sensitive receptor locations are summarised in Table 10.14.

10.14 - Predicted Unmitigated Effect Significance - Annual Mean PM₁₀ Concentrations

Receptor		Sensitivity	Impact Magnitude	Unmitigated Effect Significance
R1	Residential - Oban Close	Very Low	Negligible	Negligible
R2	Residential - Tingley Hall Rise	Very Low	Negligible	Negligible

Receptor		Sensitivity	Impact Magnitude	Unmitigated Effect Significance
R3	Residential - Bradford Road	Very Low	Negligible	Negligible
R4	Residential - Station Hall Farm	Very Low	Negligible	Negligible
R5	Residential - Tingley Avenue	Very Low	Negligible	Negligible
R6	Residential - Bradford Road	Very Low	Negligible	Negligible
R7	Education Facility - Bradford Road	Very Low	Negligible	Negligible
R8	Residential - Aspen Court	Very Low	Negligible	Negligible
R9	Residential - Dewsbury Road	Very Low	Very Minor	Negligible
R10	Residential - Dewsbury Road	Very Low	Very Minor	Negligible
R11	Residential - Dewsbury Road	Very Low	Very Minor	Negligible
R12	Education Facility - Rein Road	Very Low	Negligible	Negligible
R13	Residential - Rein Road	Very Low	Negligible	Negligible
R14	Residential - Dewsbury Road	Very Low	Very Minor	Negligible
R15	Residential - Leeds Road	Very Low	Very Minor	Negligible
R16	Residential - Leeds Road	Very Low	Very Minor	Negligible
R17	Residential - Heybeck Lane	Very Low	Very Minor	Negligible
R18	Residential - Leeds Road	Very Low	Very Minor	Negligible
R19	Residential - Leeds Road	Very Low	Very Minor	Negligible
R20	Residential - Leeds Road	Very Low	Very Minor	Negligible
R21	Residential - Leeds Road	Very Low	Very Minor	Negligible
R22	Residential - Leeds Road	Very Low	Very Minor	Negligible
R23	Residential - Leeds Road	Very Low	Very Minor	Negligible
R24	Residential - Leeds Road	Very Low	Very Minor	Negligible
R25	Residential - Leeds Road	Very Low	Very Minor	Negligible
R26	Residential - Leeds Road	Very Low	Minor	Negligible
R27	Residential - Leeds Road	Very Low	Very Minor	Negligible
R28	Residential - Leeds Road	Very Low	Very Minor	Negligible
R29	Residential - Leeds Road	Very Low	Minor	Negligible
R30	Residential - Leeds Road	Very Low	Very Minor	Negligible
R31	Education Facility - Leeds Road	Very Low	Very Minor	Negligible
R32	Residential - Highgate Road	Very Low	Negligible	Negligible
R33	Residential - Highgate Road	Very Low	Negligible	Negligible
R34	Residential - Soothill Lane	Very Low	Negligible	Negligible
R35	Residential - Soothill Lane	Very Low	Negligible	Negligible
R36	Residential - Grange Road	Very Low	Negligible	Negligible
R37	Education Facility- Soothill Lane	Very Low	Negligible	Negligible
R38	Residential - Heybeck Lane	Very Low	Negligible	Negligible
R39	Residential - Heybeck Lane	Very Low	Negligible	Negligible
R40	Education Facility - Heybeck Lane	Very Low	Negligible	Negligible
R41	Residential - Chidswell Lane	Very Low	Negligible	Negligible
R42	Residential - Windsor Drive	Very Low	Negligible	Negligible
R43	Residential - Owl Lane	Very Low	Negligible	Negligible
R44	Residential - Owl Lane	Very Low	Negligible	Negligible
R45	Residential - Chidswell Lane	Very Low	Negligible	Negligible

Receptor		Sensitivity	Impact Magnitude	Unmitigated Effect Significance
R46	Residential - Kingsway	Very Low	Negligible	Negligible
R47	Residential - Kingsway	Very Low	Negligible	Negligible
R48	Education Facility - Leeds Road	Very Low	Negligible	Negligible
R49	Residential - Lodge Hill Road	Very Low	Negligible	Negligible
R50	Residential - Cross Keys	Very Low	Negligible	Negligible
R51	Residential - Wakefield Road	Very Low	Negligible	Negligible
R52	Residential - Batley Road	Very Low	Negligible	Negligible

10.83 As indicated in Table 10.3, unmitigated effects on annual mean PM₁₀ concentrations as a result of the Proposed Development were predicted to be **negligible** at all receptors. These effects are considered to be **long term, permanent** and **local**.

Future Exposure

10.84 The Proposed Development has the potential to cause exposure of future occupants to elevated air pollutant levels. Dispersion modelling was therefore undertaken with the inputs described in Appendix 10.2 to quantify air quality conditions at the Site. This included consideration of vehicle exhaust emissions on the local road network, as well as other background sources. Reference should be made to Figures 10.3 and 10.4 for graphical representations of the results for NO₂ and PM₁₀ concentrations, respectively.

10.85 As shown in Figure 10.3, annual mean NO₂ concentrations were predicted to be below the AQO of 40µg/m³ at all locations across the Site. The maximum level at the boundary was 18.82µg/m³. As such, future occupants are not predicted to be exposed to NO₂ concentrations above the AQO.

10.86 As shown in Figure 10.4, annual mean PM₁₀ concentrations were predicted to be below the AQO of 40µg/m³ at all locations across the Site. The maximum level at the boundary was 15.32µg/m³. As such, future occupants are not predicted to be exposed to PM₁₀ concentrations above the AQO.

10.87 Based on the assessment results, the Site is considered suitable for the proposed end use.

Mitigation Measures

Construction Phase

10.88 The IAQM guidance⁴⁸ provides potential mitigation measures to reduce effects as a result of fugitive dust emissions during the construction phase. These have been adapted for the Proposed Development as summarised in Table 10.15.

⁴⁸ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

10.15 - Fugitive Dust Emission Mitigation Measures

Guidance	Comment
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on Site Display the name and contact details of person(s) accountable for air quality and dust issues on the Site boundary. This may be the environment manager/engineer or the site manager Display the head or regional office contact information Develop and implement a Construction Environmental Management Plan (CEMP), which includes measures to control dust and any other emissions, approved by the LA
Site management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken Make the complaints log available to the LA upon request Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book Hold regular liaison meetings with other high risk construction sites within 500 m of the Site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes
Monitoring	Undertake daily on-site and off-site visual inspection to monitor dust, record inspection results, and make the log available to the LA upon request Carry out regular site inspections to monitor compliance with the CEMP, record inspection results, and make an inspection log available to the LA upon request Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions
Site preparation	Plan layout so that machinery and dust causing activities are located away from receptors, as far as is possible Fully enclose specific operations where there is a high potential for dust production and they are active for an extensive period Avoid site runoff of water or mud Keep site fencing, barriers and scaffolding clean using wet methods Remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used Cover, seed or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary - no idling vehicles Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas Include a Construction Logistics Plan within the CEMP to manage the sustainable delivery of goods and materials

Guidance	Comment
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques Ensure an adequate water supply on the Site for effective dust suppression, using non-potable water where possible and appropriate Use enclosed chutes and conveyors and covered skips Minimise drop heights and use fine water sprays wherever appropriate Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste management	Avoid bonfires and burning of waste materials
Earthworks	Re-vegetate 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
Construction	Avoid scabbling (roughening of concrete surfaces) if possible Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out 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
Trackout	Use water-assisted dust sweeper on access and local roads, if required Avoid dry sweeping of large areas Ensure vehicles entering and leaving Site are covered to prevent escape of materials Implement a wheel washing system, if required Access gates to be located at least 10m from receptors where possible

Operational Phase

10.89 The following mitigation was identified in order to reduce potential air quality impacts as a result of operational phase road vehicle exhaust emissions:

- All Heavy Duty Vehicle (HDV) movements produced from the Proposed Development that travel towards Dewsbury Town Centre will be prevented from utilising the portion of Leeds Road included within Kirklees AQMA 5.

10.90 In order to evaluate the effectiveness of the proposed mitigation, further dispersion modelling was undertaken. This considered an additional scenario, defined as 'DS - With Mitigation', whereby HDV movements produced by the Proposed Development are prevented from travelling along the portion of Leeds Road included within Kirklees AQMA 5. The results of this analysis are provided in the Residual Effects Section.

10.91 It should be noted that the Proposed Development is classified as **major** in accordance with the West Yorkshire Air Quality and Emissions: Technical Planning Guidance⁴⁹. This document provides mitigation measures that should be considered for inclusion within future schemes. These should be reviewed at reserved matters stage, when details of the end users and associated operations are known, and relevant measures identified.

⁴⁹ Air Quality and Emissions: Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

Cumulative Effects

Construction Phase

10.92 The Proposed Development may result in cumulative dust emission impacts should the construction phase overlap with that of any other scheme within 700m of the Site boundary. However, as previously outlined, any fugitive emissions generated by the Proposed Development would be controlled through the outlined mitigation and similar measures would be anticipated for any other local developments. Therefore, residual cumulative effects are predicted to be **not significant** with respect to the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

Operational Phase

10.93 There is the potential for cumulative operational phase road vehicle exhaust emission impacts should other developments generate traffic which utilised the same routes as movements generated by the Proposed Development. It is confirmed that the traffic data provided by the Transport Consultants for the project includes traffic growth associated with committed and allocated sites in the local area. As such, residual cumulative effects are therefore predicted to be **not significant** with respect to the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

Residual Effects

Construction Phase

10.94 During the construction phase of the Proposed Development there is the potential for air quality impacts as a result of fugitive dust emissions from the Site. These were assessed in accordance with the IAQM methodology⁵⁰. With the outlined mitigation measures implemented, residual effects from all dust generating activities are predicted to be **not significant** with respect to the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

Operational Phase

10.95 As outlined previously, dispersion modelling was undertaken in order to quantify potential impacts following implementation of the relevant mitigation. The results are provided below. Reference should be made to Appendix 10.2 for the relevant model input details.

Nitrogen Dioxide

10.96 Annual mean NO₂ concentrations were predicted at the sensitive receptor locations for the DM and DS - With Mitigation scenarios and are shown in Appendix 10.3.

10.97 Predicted residual effects on annual mean NO₂ concentrations at sensitive receptor locations are summarised in Table 10.16.

10.16 - Predicted Residual Effect Significance - Annual Mean NO₂ Concentrations

Receptor	Sensitivity	Impact Magnitude	Residual Effect Significance
R1	Residential - Oban Close	Very Low	Negligible
R2	Residential - Tingley Hall Rise	Very Low	Negligible
R3	Residential - Bradford Road	Very Low	Negligible
R4	Residential - Station Hall Farm	Very Low	Negligible
R5	Residential - Tingley Avenue	Very Low	Negligible
R6	Residential - Bradford Road	Very Low	Negligible
R7	Education Facility - Bradford Road	Very Low	Negligible
R8	Residential - Aspen Court	Very Low	Negligible

⁵⁰ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Receptor		Sensitivity	Impact Magnitude	Residual Effect Significance
R9	Residential - Dewsbury Road	Very Low	Minor	Negligible
R10	Residential - Dewsbury Road	Very Low	Minor	Negligible
R11	Residential - Dewsbury Road	Very Low	Minor	Negligible
R12	Education Facility - Rein Road	Very Low	Negligible	Negligible
R13	Residential - Rein Road	Very Low	Negligible	Negligible
R14	Residential - Dewsbury Road	Very Low	Minor	Negligible
R15	Residential - Leeds Road	Very Low	Minor	Negligible
R16	Residential - Leeds Road	Very Low	Minor	Negligible
R17	Residential - Heybeck Lane	Very Low	Minor	Negligible
R18	Residential - Leeds Road	Very Low	Minor	Negligible
R19	Residential - Leeds Road	Very Low	Minor	Negligible
R20	Residential - Leeds Road	Very Low	Minor	Negligible
R21	Residential - Leeds Road	Very Low	Minor	Negligible
R22	Residential - Leeds Road	Very Low	Minor	Negligible
R23	Residential - Leeds Road	Very Low	Minor	Negligible
R24	Residential - Leeds Road	Very Low	Minor	Negligible
R25	Residential - Leeds Road	Very Low	Minor	Negligible
R26	Residential - Leeds Road	Very Low	Minor	Negligible
R27	Residential - Leeds Road	Very Low	Minor	Negligible
R28	Residential - Leeds Road	Very Low	Minor	Negligible
R29	Residential - Leeds Road	Low	Minor	Minor Adverse
R30	Residential - Leeds Road	Low	Minor	Minor Adverse
R31	Education Facility - Leeds Road	Very Low	Minor	Negligible
R32	Residential - Highgate Road	Very Low	Very Minor	Negligible
R33	Residential - Highgate Road	Very Low	Negligible	Negligible
R34	Residential - Soothill Lane	Very Low	Very Minor	Negligible
R35	Residential - Soothill Lane	Very Low	Very Minor	Negligible
R36	Residential - Grange Road	Very Low	Very Minor	Negligible
R37	Education Facility- Soothill Lane	Very Low	Negligible	Negligible
R38	Residential - Heybeck Lane	Very Low	Very Minor	Negligible
R39	Residential - Heybeck Lane	Very Low	Negligible	Negligible
R40	Education Facility - Heybeck Lane	Very Low	Negligible	Negligible
R41	Residential - Chidswell Lane	Very Low	Very Minor	Negligible
R42	Residential - Windsor Drive	Very Low	Very Minor	Negligible
R43	Residential - Owl Lane	Very Low	Very Minor	Negligible
R44	Residential - Owl Lane	Very Low	Minor	Negligible
R45	Residential - Chidswell Lane	Very Low	Very Minor	Negligible
R46	Residential - Kingsway	Very Low	Very Minor	Negligible
R47	Residential - Kingsway	Very Low	Negligible	Negligible
R48	Education Facility - Leeds Road	Very Low	Very Minor	Negligible
R49	Residential - Lodge Hill Road	Very Low	Very Minor	Negligible
R50	Residential - Cross Keys	Very Low	Negligible	Negligible
R51	Residential - Wakefield Road	Very Low	Negligible	Negligible

Receptor		Sensitivity	Impact Magnitude	Residual Effect Significance
R52	Residential - Batley Road	Very Low	Negligible	Negligible

10.98 As indicated in Table 10.16, residual effects on annual mean NO₂ concentrations as a result of the Proposed Development were predicted to be **minor adverse** at two receptors, namely R29 and R30, and **negligible** at the remaining 50 locations. These effects are considered to be **long term, permanent** and **local**.

Particulate Matter

10.99 Annual mean PM₁₀ concentrations were predicted at the sensitive receptor locations for the DM and DS - With Mitigation scenarios and are shown in Appendix 10.3.

10.100 Predicted residual effects on annual mean PM₁₀ concentrations at sensitive receptor locations are summarised in Table 10.17.

10.17 - Predicted Residual Effect Significance - Annual Mean PM₁₀ Concentrations

Receptor		Sensitivity	Impact Magnitude	Residual Effect Significance
R1	Residential - Oban Close	Very Low	Negligible	Negligible
R2	Residential - Tingley Hall Rise	Very Low	Negligible	Negligible
R3	Residential - Bradford Road	Very Low	Negligible	Negligible
R4	Residential - Station Hall Farm	Very Low	Negligible	Negligible
R5	Residential - Tingley Avenue	Very Low	Negligible	Negligible
R6	Residential - Bradford Road	Very Low	Negligible	Negligible
R7	Education Facility - Bradford Road	Very Low	Negligible	Negligible
R8	Residential - Aspen Court	Very Low	Negligible	Negligible
R9	Residential - Dewsbury Road	Very Low	Very Minor	Negligible
R10	Residential - Dewsbury Road	Very Low	Very Minor	Negligible
R11	Residential - Dewsbury Road	Very Low	Very Minor	Negligible
R12	Education Facility - Rein Road	Very Low	Negligible	Negligible
R13	Residential - Rein Road	Very Low	Negligible	Negligible
R14	Residential - Dewsbury Road	Very Low	Very Minor	Negligible
R15	Residential - Leeds Road	Very Low	Very Minor	Negligible
R16	Residential - Leeds Road	Very Low	Very Minor	Negligible
R17	Residential - Heybeck Lane	Very Low	Very Minor	Negligible
R18	Residential - Leeds Road	Very Low	Very Minor	Negligible
R19	Residential - Leeds Road	Very Low	Very Minor	Negligible
R20	Residential - Leeds Road	Very Low	Very Minor	Negligible
R21	Residential - Leeds Road	Very Low	Very Minor	Negligible
R22	Residential - Leeds Road	Very Low	Very Minor	Negligible
R23	Residential - Leeds Road	Very Low	Very Minor	Negligible
R24	Residential - Leeds Road	Very Low	Very Minor	Negligible
R25	Residential - Leeds Road	Very Low	Very Minor	Negligible
R26	Residential - Leeds Road	Very Low	Very Minor	Negligible
R27	Residential - Leeds Road	Very Low	Very Minor	Negligible
R28	Residential - Leeds Road	Very Low	Very Minor	Negligible
R29	Residential - Leeds Road	Very Low	Very Minor	Negligible

Receptor		Sensitivity	Impact Magnitude	Residual Effect Significance
R30	Residential - Leeds Road	Very Low	Very Minor	Negligible
R31	Education Facility - Leeds Road	Very Low	Very Minor	Negligible
R32	Residential - Highgate Road	Very Low	Negligible	Negligible
R33	Residential - Highgate Road	Very Low	Negligible	Negligible
R34	Residential - Soothill Lane	Very Low	Negligible	Negligible
R35	Residential - Soothill Lane	Very Low	Negligible	Negligible
R36	Residential - Grange Road	Very Low	Negligible	Negligible
R37	Education Facility- Soothill Lane	Very Low	Negligible	Negligible
R38	Residential - Heybeck Lane	Very Low	Negligible	Negligible
R39	Residential - Heybeck Lane	Very Low	Negligible	Negligible
R40	Education Facility - Heybeck Lane	Very Low	Negligible	Negligible
R41	Residential - Chidswell Lane	Very Low	Negligible	Negligible
R42	Residential - Windsor Drive	Very Low	Negligible	Negligible
R43	Residential - Owl Lane	Very Low	Negligible	Negligible
R44	Residential - Owl Lane	Very Low	Negligible	Negligible
R45	Residential - Chidswell Lane	Very Low	Negligible	Negligible
R46	Residential - Kingsway	Very Low	Negligible	Negligible
R47	Residential - Kingsway	Very Low	Negligible	Negligible
R48	Education Facility - Leeds Road	Very Low	Negligible	Negligible
R49	Residential - Lodge Hill Road	Very Low	Negligible	Negligible
R50	Residential - Cross Keys	Very Low	Negligible	Negligible
R51	Residential - Wakefield Road	Very Low	Negligible	Negligible
R52	Residential - Batley Road	Very Low	Negligible	Negligible

10.101 As indicated in Table 10.17, residual effects on annual mean PM₁₀ concentrations as a result of the Proposed Development were predicted to be **negligible** at all receptors. These effects are considered to be **long term, permanent** and **local**.

Overall Residual Effect Significance

10.102 The overall residual effect significance of operational phase impacts was determined as **minor adverse**. This was based on the overall predicted impacts at discrete receptor locations following implementation of the proposed mitigation, predicted concentrations at the Site and the considerations outlined previously. Further justification is provided in Table 10.18.

10.18 - Overall Residual Operational Phase Road Vehicle Exhaust Emissions Effect Significance

Guidance	Comment
The existing and future air quality in the absence of the development	Predicted annual mean NO ₂ and PM ₁₀ concentrations were below the AQOs at all sensitive receptors in the DM scenario. It is considered unlikely that future air quality conditions will change significantly in the absence of the development given the relatively established nature of the area
The extent of current and future population exposure to the impacts	The development is not predicted to affect the population exposed to exceedences of the AQOs
The influence and validity of any assumptions adopted when undertaking the prediction of impacts	The assessment assumed that vehicle exhaust emission rates and background pollutant levels reduce in accordance with pessimistic estimates of future conditions, rather than DEFRA predictions. This ensured a robust analysis of the opening year scenarios

Guidance	Comment
	Due to the adopted assumptions it is considered the presented results are sufficiently robust for an assessment of this nature

10.103 The IAQM guidance⁵¹ states that only if the impact is **moderate** or **major**, the effect is considered **significant**. As impacts were predicted to be **minor adverse**, overall residual effects are considered **not significant** with respect to the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

Summary of Residual Effects

10.18 - Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Significant Effect Without Mitigation	Receptor(s)	Mitigation Measure	Residual Impact and Effect
<i>Construction Phase</i>			
Annoyance due to dust soiling	Human Receptors	As outlined in Table 10.15	Negligible, long term, temporary, local and not significant
Health effects due to increased exposure to PM₁₀	Human Receptors	As outlined in Table 10.15	Negligible, long term, temporary, local and not significant
Ecological effects due to dust deposition	Ecological Receptors	As outlined in Table 10.15	Negligible, long term, temporary, local and not significant
<i>Operational Phase</i>			
Increases in NO₂ and PM₁₀ concentrations as a result of vehicle exhaust emissions	Sensitive Receptors identified in Table 10.9	As outlined in Paragraph 10.89	Minor adverse, long term, permanent, local and not significant
Exposure of future occupants to exceedences of the AQOs	Future Occupants	None required	Not significant

Summary

10.104 The Proposed Development has the potential to cause air quality impacts as a result of fugitive dust emissions during construction and road traffic exhaust emissions associated with vehicles travelling to and from the Site during operation, as well as expose future occupants to any existing air quality issues. As such, an assessment was required in order to determine baseline conditions and assess potential effects as a result of the scheme.

10.105 During the construction phase of the Proposed Development there is the potential for air quality impacts as a result of fugitive dust emissions from the Site. These were assessed in accordance with the IAQM methodology⁵². Assuming good practice dust control measures are implemented, the residual significance of potential air quality effects from dust generated by earthworks, construction and trackout activities was predicted to be **not significant** with respect to the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

10.106 The Proposed Development has the potential to expose future users to elevated pollution levels and impact existing air quality in the vicinity of the Site during operation. Dispersion modelling was therefore undertaken using ADMS-Roads in order to predict pollutant

⁵¹ Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

⁵² Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

concentrations as a result of emissions from the local highway network. Results were subsequently verified using local monitoring data.

10.107 Review of the dispersion modelling results indicated that effects on annual mean NO₂ concentrations as a result of traffic generated by the development were predicted to be **minor adverse** at two positions and **negligible** at 50 locations following implementation of the relevant mitigation. Residual effects on annual mean PM₁₀ concentrations were predicted to be **negligible** at all sensitive receptors.

10.108 The results of the dispersion modelling assessment also indicated that predicted NO₂ and PM₁₀ concentrations were below the relevant AQOs at all locations across the Proposed Development. The Site is therefore considered suitable for the proposed end use from an air quality perspective.

10.109 Following consideration of the relevant issues, the residual significance of potential air quality effects as result of traffic generated by the development was considered to be **not significant**, with respect to the Town and Country Planning (Environmental Impact Assessment) Regulations (2017).

References

Air Quality and Emissions: Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

DEFRA, Background Mapping Data, 2019. Online at <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2017>.

DMRB Volume 11, Section 3, Part 1, HA207/07, Highways Agency, 2007.

Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

KLP, KMDC, 2019.

Land-Use Planning & Development Control: Planning for Air Quality, IAQM, 2017.

Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

NPPF, Ministry of Housing, Communities and Local Government, 2019.

The AQS for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

11 Flood Risk and Drainage

Introduction

- 11.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development with respect to Flood Risk and Drainage. This Chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 11.2 Alex Perryman is an Associate at Delta-Simons with over 17 years' experience in the water industry specialising in Flood Risk and Drainage Environmental Statements for Environmental Impact Assessments (EIA) and associated Flood Risk Assessments (FRA) ranging from large road and rail schemes down to smaller infrastructure and development schemes.
- 11.3 Appendix 11.1 contains the Flood Risk Assessment (FRA) and Drainage Strategy (DS) which is associated with this ES Chapter.
- 11.4 This Chapter of the ES has been prepared in accordance with the requirements, strategies and policies of the Kirklees Local Plan (adopted 27 February 2019).

Legislative and Policy Context

European Legislation

- 11.5 The Water Framework Directive 2000/60/EC establishes a framework for community action in the field of water policy. The Water Framework Directive (WFD) seeks to enhance the status of aquatic ecosystems, promotes sustainable water use and contributes to mitigating the effects of flood and drought. It is a requirement of the WFD that member states classify major rivers and their tributaries in terms of their ecological status with reference to biological, chemical and hydromorphological quality indicators.
- 11.6 The Groundwater Directive (80/68/EEC as amended) addresses the protection of groundwater against pollution caused by certain dangerous substances and places an obligation on member states to prevent pollution of groundwater by substances including hydrocarbons and control the introduction of named metals, including copper.
- 11.7 The Groundwater Daughter Directive (2006/118/EC), the "Daughter Directive" to the WFD, establishes specific measures as provided for in the WFD to prevent and control groundwater pollution. It defines criteria for the assessment of good groundwater chemical status.
- 11.8 The EU Directive on the assessment and management of flood risks [2007/60/EC] (the 'Floods' Directive), came into force late in 2008. The Directive requires member states to develop and update a series of tools for managing all sources of flood risk, in particular:
- preliminary flood risk assessments (PFRAs);
 - flood risk and flood hazard maps;
 - flood risk management plans;
 - co-ordination of flood risk management at a strategic level;
 - improved public participation in flood risk management; and
 - co-ordination of flood risk management with the WFD.
- 11.9 The Nitrates Directive (91/676/EEC) aims to reduce nitrate concentrations from agriculture entering water systems.

UK Legislation

11.10 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 implements the WFD.

11.11 The Groundwater (Water Framework Directive) (England and Wales) Regulations 2009 and Groundwater (Water Framework Directive) (England) Direction 2014 transpose the Groundwater Daughter Directive. The Daughter Directive requirements have been transposed into UK law by the Environmental Permitting (England and Wales) Regulations 2016.

11.12 The requirements of the Flood Directive were initially met by the Flood Risk Regulations 2009, which was consolidated into the Flood and Water Management Act 2010. The Flood and Water Management Act (2010) clarifies responsibilities for land drainage and flood risk management and transfers some key responsibilities to local authorities.

11.13 The Water Resources Act 1991 (and Land Drainage bylaws) require the prior written consent of the Environment Agency for any works or structures, in, over under or within 8 metres of any watercourse designated as a 'main river'.

11.14 The Nitrates Directive is implemented by the Nitrate Pollution Prevention Regulations 2015, which include:

- a requirement to designate Nitrate Vulnerable Zones (NVZs);
- a requirement to plan nitrogen applications on agricultural land;
- the setting of limits on nitrogen fertiliser applications;
- the establishment of closed periods for spreading; and
- controls on the application and storage of organic manure.

11.15 The Land Drainage Act 1991 places responsibility for maintaining flows in watercourses on landowners. Classified watercourses maintained by the Environment Agency (EA) are termed "Main Rivers." The EA has powers to control works in, over, under, on the banks of, within 7 to 10m of the top of the bank of the river, and of all floodplain areas through the issuing of Land Drainage Consents.

11.16 The EA is responsible for assessing farmers' compliance with measures in NVZs.

National Planning Policy

11.17 The revised National Planning Policy Framework (NPPF) was last published on 24th July 2018 (superseding Planning Policy Statement 25 (PPS25)) and most recently updated on 19th June 2019. It is supported by the National Planning Practice Guidance (NPPG), which is a 'live' document.

11.18 The NPPF seeks to ensure that climate change is considered for long term factors such as flood risk, coastal change, water supply and changes to biodiversity and landscape. New development should therefore be planned to avoid increased vulnerability to the range of effects arising from climate change. Where new development is brought forward in areas which are vulnerable to the range of effects arising from climate change, care should be taken to ensure that flood risk can be managed through sustainable adaptation measures.

11.19 In relation to flood risk, inappropriate development in areas at high risk of flooding should be avoided by directing development away from areas at the highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere and taking into account the effects of climate change.

11.20 Any assessment of the potential effects on the water environment must also take account of relevant national legislation, as well as national and local planning policies.

11.21 NPPF states that a site-specific Flood Risk Assessment (FRA) is required for: proposals of 1 hectare or greater in Flood Zone 1; all proposals for new development in Flood Zones 2 and 3; proposals in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency (EA)); any proposed development or a change of use to a more vulnerable use, on land in Flood Zone 1 which may be subject to other sources of flooding.

National Standards for Sustainable Drainage Systems (2015)

11.22 The National Standards for Sustainable Drainage Systems published by DEFRA set out the technical standards, which are non-statutory, to be utilised in conjunction with the NPPF and associated NPPG.

Non-Statutory Technical Standards for Sustainable Drainage (2015)

11.23 LASOO (Local Authority SuDS Officer Organisation) published the Non-Statutory Technical Standards for Sustainable Drainage in 2015, this establishes the principles for considering sustainable drainage at a planning stage to include:

- Layout;
- Density;
- Site Access;
- Topography;
- Ground Conditions; and
- Discharge Destination.

The Water Resources Act (1991)

11.24 Under the Water Resources Act 1991 (Section 85) it is an offence to cause or knowingly permit poisonous, noxious, or polluting matter, or any solid waste matter to enter controlled waters (which include rivers). The consenting regime for discharges to controlled waters is set out in the Environmental Permitting (England and Wales) Regulations 2016.

The Flood and Water Management Act (2010)

11.25 The Flood and Water Management Act 2010 intends to provide better, more comprehensive management of flood risk for people, homes and businesses. It also improves the affordability of water bills and helps ensure continuity of water supplies. In particular, it encourages the uptake of sustainable drainage systems by removing the automatic right to connect to sewers and providing for unitary and county councils to adopt Sustainable Drainage Systems (SuDS) for new developments and redevelopments.

EU Floods Directive and the Flood Risk Regulations (2009)

11.26 The Flood Risk Regulations 2009 transpose the EU Floods Directive into law in England and Wales. The EU Floods Directive aims to provide a consistent approach to flood risk management across all of Europe. Under these Regulations, there are a series of requirements which take place as part of a six-year cycle in the following order:

- At the beginning of the cycle, Lead Local Flood Authorities (LLFAs) need to prepare or review their Preliminary Flood Risk Assessment (PFRAs) to determine and identify Flood Risk Areas. Then LLFAs have a duty to prepare or review their flood hazard and flood risk maps for each of their Flood Risk Areas.
- By the end of the cycle, LLFAs must prepare flood risk management plans in order to manage significant flood risk in their Flood Risk Areas. These flood risk management plans should set objectives for flood risk management and outline measures for achieving these objectives.

- PFRAs, flood hazard and flood risk maps, and flood risk management plans are published by the EA.

Building Regulations Part H

11.27 Buildings Regulations Part H provide guidance in terms of foul drainage, wastewater treatment systems and cesspools, rainwater drainage, building over sewers, separate systems for surface water and foul waste disposal.

11.28 In relation to flood risk, Buildings Regulations Part H sets out a hierarchy of where surface water should discharge. This hierarchy should be followed where practicable and is listed below.

11.29 Infrastructure protocol states that a designer should consider the following in order of preference before finalising a surface water design statement for the development.

- Discharge to SuDS devices, e.g. an adequate soakaway or some other adequate infiltration system;
- Discharge to a watercourse or where this is not reasonably practicable; and
- Discharge to a public sewer network.

Local Planning Policy

11.30 The Kirklees Metropolitan District Council (KMDC) Local Plan adopted February 2019 contains the following policies relating to Flood Risk Assessment / Sustainable Drainage Strategy.

Table 1 – Kirklees Local Plan – Local Planning Policy LP27 and LP28

Flood Risk (LP27)
Proposals for development which require a Sequential Test in accordance with national planning guidance will need to demonstrate that development has been directed to areas at the lowest probability of flooding, following a sequential risk-based approach. The whole Kirklees district should be the starting point for the sequential test with applicants required to provide justification where a smaller area of search is proposed. If following application of the Sequential Test, there are no reasonably available sites which could accommodate the development in zones with a lower probability of flooding, it should also be demonstrated that a sequential approach has been applied within sites. This is to ensure that highly vulnerable and more vulnerable uses are directed towards the areas of lowest flood risk within the site. Proposals will also need to demonstrate that the exception test is passed, where applicable, as set out in national planning policy. Proposals within flood zone 3ai will be assessed in accordance with national policies relating to flood zone 3a but with all of the following additional restrictions: - no new highly vulnerable or more vulnerable uses will be permitted; - less vulnerable uses may only be permitted provided that the sequential test has been passed and; - where extensions are linked operationally to an existing business or, - where redevelopment of a site provides buildings with the same or a smaller footprint; - all proposals will be expected to include flood mitigation measures such as compensatory storage which should be identified and considered through a site-specific FRA; - development will not be permitted on any part of the site identified through a site-specific FRA as performing a functional floodplain role.

Flood Risk (LP27)

Proposals must be supported by an appropriate site-specific FRA in line with national planning policy. This must take account of all sources of flooding set out in the Strategic Flood Risk Assessment (SFRA) and demonstrate that the proposal will be safe throughout the lifetime of the development (taking account of climate change). The proposal must also not increase flood risk elsewhere and where possible should reduce flood risk. Mitigation measures, where necessary, should be proposed.

Proposals involving building over existing culverts or the culverting or canalisation of water courses will not be permitted unless it can be demonstrated to be in the interests of public safety or to provide essential infrastructure and that there will be no detrimental effect on flood risk and biodiversity. Where feasible, development proposals should incorporate re-opening of culverts, modification of canalised water courses and consideration of mitigation measures to achieve a more natural and maintainable state.

Proposals for natural management such as targeted vegetation planting in upper catchments and along river banks will be supported in appropriate locations where consistent with national and local plan policies and relevant water catchment management plans to reduce flood risk and improve water quality.

Drainage (LP28)

The presumption is that Sustainable Drainage Systems (SuDS) will be used to assist in achieving the following on each site:

- a. for proposals on greenfield sites, typical greenfield run-off rates should not be exceeded;
- b. for proposals on brownfield sites there should be a minimum 30% reduction in surface water run-off where previous positive surface water connections from the site can be proven. New connections will be subject to at least greenfield restrictions;
- c. No negative impact on local water quality and improvements in water quality where practicable;
- d. Consider whether proposed open spaces and green infrastructure within sites can contribute to the sustainable drainage of the site.

Local conditions including the existence of critical drainage areas may require a lower run-off rate to be agreed to reflect volume control, local surface water risks, water course capacity and flood risk further downstream.

There will be a general presumption against pumping surface water. It must also be demonstrated that the surface water management solution is designed to meet requirements over the lifetime of the development including evidence that management and maintenance arrangements have been secured to cover that period. This includes ensuring proposals to store water meet national standards and latest best practice.

Flow paths accommodating water from outside the site or due to an exceedance event should be designed to avoid buildings and curtilages.

Development will only be permitted if it can be demonstrated that the water supply and waste water infrastructure required is available or can be co-ordinated to meet the demand generated by the new development.

Assessment Methodology and Significance Criteria

11.31 Assessment of potential development impacts on flood risk and drainage has been undertaken through a combination of desk-based analysis, site survey work, qualitative and quantitative impact assessment and consideration of potential impact mitigation requirements.

11.32 Potential development effects have been defined by reference to baseline geological, hydrological and hydrogeological assessment and detailed development design proposals. Where necessary, mitigation measures have been defined for any effects considered to be significant

with the aim of reducing any residual risk to an acceptable level. The criteria for determining the significance of effects is based upon the following methodology, using the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 10 (HD 45/09) as a guide:

- Assessment of potential receptor sensitivity.
- Assessment of potential magnitude of impact.
- Determination of potential effect significance.

Assessment Methodology

11.33 As summarised in Tables 2, 3 and 4, magnitude is considered in relation to the potential impact on the receptor with magnitude defined in a range from Negligible to Major. The receptor sensitivity is defined as Low, Medium or High depending on the specific receptor character and its ability to tolerate change. The significance of the effect is defined in relation to both the magnitude of the impact and receptor significance. If the significance of the potential effect is 'Moderate Adverse' or higher, then mitigation measures may need to be considered, see Table 4.

Table 2 – Methodology for determining sensitivity

Sensitivity	Examples of Receptor
High	WFD Classification – Good or High Site protected under EU or UK wildlife legislation (SAC, SPA, SSSI, Ramsar site); European Designated salmonid fishery (or salmonid & cyprinid fishery); Important social or economic uses such as water supply, navigation or mineral extraction. Floodplain or defence protecting 1 or more residential properties or industrial premises from flooding
Medium	WFD Classification: Moderate May be designated as a local wildlife site. May support a small / limited population of protected species. Limited social or economic uses. Floodplain or defence protecting 10 or fewer industrial properties from flooding
Low	WFD classification - Poor No nature conservation designations. Low aquatic fauna and flora biodiversity and no protected species. Minimal economic or social uses. Floodplain with limited constraints and a low probability of flooding of residential and industrial properties

Table 3 Methodology for determining impact magnitude

Magnitude of Impact	Examples of Receptor
Major	Loss of Protected Area. Pollution of potable sources of water abstraction. Deterioration of a water body leading to a failure to meet Good Ecological Status (GES) under the WFD and reduction in Class (or prevents the successful implementation of mitigation measures for heavily modified or artificial water bodies). Increase in peak flood level (1% annual probability) >100 mm.
Moderate	Loss in production of fishery. Discharge of a polluting substance to a watercourse but insufficient to change its water quality status (WFD class) in the long term. No reduction in WFD class, but effect may prevent improvement (if not already at GES) or the successful implementation of mitigation measures for heavily modified or artificial water bodies. Increase in peak flood level (1% annual probability) >50 mm
Minor	Noticeable effect on features, or key attributes of features, on the Protected Areas Register. Measurable changes in attribute but of limited size and / or proportion, which does not lead to a reduction in WFD status or failure to improve. Increase in peak flood level (1% annual probability) >10mm
Negligible	No effect on features, or key attributes of features, on the Protected Areas Register. Discharges to watercourse but no significant loss in quality, fishery productivity or biodiversity. No effect on WFD classification or water body target. Negligible change in peak flood level (1% annual probability) <+/- 10 mm
Beneficial	Improvement on features, or key attributes of features, on the Protected Areas Register. Improvement in fishery production or biodiversity. Improvement in WFD classification or water body target. Reduction in peak flood level (1% annual probability) >+/- 10 mm

Significance Criteria

Table 4 – Effect of significance matrix

<i>Magnitude</i>	Sensitivity		
	<i>High</i>	<i>Medium</i>	<i>Low</i>
Major	Major Adverse/Beneficial	Major-Moderate Adverse/Beneficial	Moderate-Minor Adverse/Beneficial
Moderate	Major-Moderate Adverse/Beneficial	Moderate-Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate-Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor-Negligible
Negligible	Negligible	Negligible	Negligible

11.34 In considering the significance of the effect account is taken of an effect's duration; reversibility and compatibility with relevant environmental policies and standards. Effects can be temporary or permanent. Temporary effects are largely associated with the construction phase and permanent effects are largely associated with the operational phase.

Limitations and Assumptions

11.35 The methodology for assessment of potential water resource and flood risk effects has incorporated the following assumptions:

- That Site access roads would be surfaced with compacted hardcore or similar and therefore assumed to be effectively impermeable;
- Any runoff from waste materials would be collected, contained and prevented from direct entry to local watercourses;
- That all clean roof drainage would be discharged directly to the nearest surface water drainage channel;
- Analysis of flood extents is reliant on the accuracy of the published EA Flood Map for Planning and EA flood data. No new hydraulic modelling has been undertaken as part of this study;
- There has been no independent testing or analysis of Site-specific waste products; and
- Assumed finished floor levels of the Proposed Development will be set at a minimum of 150 mm above existing ground levels in line with Building Regulations for England and Wales (Part C) as recommended in the FRA.

Baseline Conditions

11.36 The Site is located to the east of the A653 Leeds Road dual carriageway, which is a strategic corridor between Dewsbury and Leeds. It is approximately 11km west of Wakefield, 14km east of Huddersfield and 22km south of Leeds. The Site is bordered by fields to the north, east and west with Dum Wood and terraced residential properties beyond to the north. The A653 and adjacent residential properties border the Site to the west. Access to the Site is provided from the A653 to the west.

11.37 Further detail on the baseline flood risk and topographic information is provided in Appendix 11.1, including the proposed parameter plans and zones for the EIA. A summary is provided below on each source of flooding (rivers or sea, surface water, groundwater and artificial sources).

Flood Risk

Flood Risk from Rivers or Sea

11.38 Due to the Site's inland location, the Site is not considered to be at risk from the sea.

11.39 The EA Flood Map for Planning indicates that the Site is wholly within Flood Zone 1 (Low Probability), meaning that the Site is situated in an area that has less than 1 in 1000 annual probability of fluvial flooding (0.1% Annual Exceedance Probability (AEP)).

11.40 There are three unnamed Ordinary Watercourses within the Site, hereinafter referred to as local watercourses, which flow in a west to east direction and are tributaries of the Hey Beck which is situated approximately 245 m to the east of the Site boundary. An unnamed local watercourse has been identified across the north-eastern extent of the Site (Watercourse A), a second unnamed local watercourse is situated to the south-east (Watercourse B) and the third unnamed local watercourse forms the southern boundary of the Site (Watercourse C). These watercourses (responsibility of Kirklees Council as Lead Local Flood Authority to maintain) have been identified to drain the Site.

11.41 Local watercourses A, B and C all discharge into the Hey Beck upstream of Fenton Dam. The dam has been developed as a flood protection scheme for the downstream Westgate End protecting Wakefield downstream.

11.42 There are no records of fluvial flooding within the Site associated with these three watercourses and no known hydraulic modelling. Fluvial flooding might occur if these watercourses overtopped their banks during or following an extreme rainfall event and therefore it is possible that the EA Flood Map for Planning provides an inaccurate view of fluvial risk to the Site.

11.43 The EA Long Term Risk Map (Surface Water) has therefore been used as a proxy to assess potential fluvial risk to the Site as surface water follows topographic depressions and low points

and therefore best represents the watercourses and the potential fluvial risk to the Site. This suggests that the majority of the Site remains flood free, with flooding associated with the local watercourses that influence the Site shown to be largely confined to the watercourses and not impacting the wider Site.

11.44 There are no historical records of fluvial flooding from third party sources and the Site is not within a Critical Drainage Area (CDA) or Flood Warning Area (FWA).

11.45 Overall, the Site is at **Low** risk of flooding from fluvial sources.

Surface Water Resources and Flood Risk

11.46 The EA 'Flood Risk from Surface Water' Map indicates that the Site is predominantly at Very Low to Low risk from surface water flooding, meaning that the Site has a less than 1% annual probability of flooding.

11.47 There are two distinct flow routes shown to flow in an easterly direction across the southern extent of the Site and along its southern boundary. These surface water flow routes are associated with the local watercourses B and C which drain the wider agricultural land – as noted above, the risk is largely constrained to the watercourses and shown not to impact the wider Site.

11.48 The flowpath associated with local watercourse A has a low risk of occurring, meaning the annual probability of this area experiencing surface water flooding is between 0.1% and 1% with depths estimated to remain below 300 mm.

11.49 Flood depths are expected to remain below 300 mm across the Site and along Leeds Road during the 1% AEP rainfall event. Flood depths below 300 mm are considered passable by pedestrians and vehicles and therefore the access and egress are considered achievable from the Site.

11.50 Third party reports such as the SFRA and PFRA do not identify any Site specific risk and the Site is not considered to be within a surface water hotspot.

11.51 Overall, the Site is at **Low** risk of flooding from surface water.

Surface Water Drainage

11.52 The Site currently comprises undeveloped land which is not formally drained and is therefore considered to be 100% permeable and greenfield.

11.53 The topographical survey shows that the Site slopes downwards from a topographical high point of 124.09 metres Above Ordnance Datum (m AOD) in the western extent to a low point of 71.05 metres AOD where local watercourse A crosses the north-eastern boundary. Locally within the Site, levels fall towards Watercourses A-C which flow within the Site.

11.54 Surface water runoff from the Site will need to be managed to ensure that it will not increase the risk of flooding, notably during the operational phase either on or off the Site. To meet this objective, the following measures were undertaken and assessed below:

- a review was undertaken in accordance with the SuDS Hierarchy;
- a Drainage Strategy was developed using the relevant CIRIA C753 Guidance; and
- mitigation proposals were developed which can be incorporated into the development layout and design.

11.55 The full Drainage Strategy is contained within Appendix 11.1, Section 5.0.

Groundwater Resources and Flood Risk

11.56 The BGS Interactive Map shows that the Site is identified as being underlain by Pennine Middle Coal Measures Formation bedrock. Whilst no superficial deposits are recorded, given the presence of minor watercourses it is likely that some Alluvium underlies these areas.

- 11.57 Given the nature of the Site it is likely that there is a substantial thickness of worked topsoil across the Site. Given there are permeable deposits sat on relatively impermeable deposits there is a potential for groundwater to perch on the bedrock within the topsoil. However, given the topography of the local area this is highly unlikely to emerge on Site.
- 11.58 Given the general low permeability of the underlying soils, the locally shallow ground water and further corroborated by the presence of the unnamed watercourses serving the area, soakaways are unlikely to be suitable for the discharge of surface water runoff.
- 11.59 The underlying Bedrock deposits are described as Secondary A aquifers which are 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'.
- 11.60 The Site is not located within a Groundwater Source Protection Zone (SPZ).
- 11.61 The BGS exploratory hole record on-Site was illegible, however seven exploratory holes records within 100 m of the Site identified groundwater at 3-4 m below ground level (bgl) and perched upon boulder clay most of which rose to 1 – 1.5 m bgl.
- 11.62 Third party reports did not record any Site-specific records of groundwater flooding. Overall, the likelihood of groundwater flooding is considered **Low**.

Artificial Sources

- 11.63 There are no canals within the vicinity of the Site and the EA 'Flood Risk from Reservoirs' map shows that the Site is not with the extent of a reservoir breach or overtopping event. It can therefore be concluded that there is **Very Low** risk of flooding from reservoirs and canals.
- 11.64 As the Site is current greenfield, there are no existing public sewers on the Site, however a topographical survey suggests that the Site is bound by public sewers. Sewer systems in the area are currently designed to accommodate flows up to and including the 1 in 30-year storm event.
- 11.65 Third party reports contain no record of sewer flooding in the vicinity of the Site that can be attributed to capacity limitations in the public sewer system.
- 11.66 Overall, the risk of sewer flooding is considered **Low**.

Identification and Evaluation of Likely Significant Effects

- 11.67 The flood risk and drainage assessment above provides the basis for assessment of the potential effect of the Proposed Development on surface water resources, groundwater resources and local flood risk. The assessment has been undertaken in relation to the construction phase of the Proposed Development and the operational phase of the Proposed Development. The Proposed Development would incorporate groundworks related to ground raising and foundation excavations, new buildings and development of new areas of hardstanding.
- 11.68 As the Site is located in Flood Zone 1, climate change is not required to be assessed from a fluvial perspective as per the NPPF and associated NPPG guidance. Furthermore, nearby residential and commercial developments within Chidswell are not considered to be at risk during the baseline or future scenario as the existing urban area is located upstream and topographically higher. There is considered to be no impact on existing or future residents of Chidswell and Chidswell is therefore not considered a sensitive receptor and not assessed further as part of this assessment. No other residential and commercial properties are identified to be at risk downstream.

Construction Phase

11.69 Construction phase activities with the potential to affect water resources or flood risk include the following:

- Temporary increase in impermeable area;
- Excavation of new building foundations;
- Establishment of new areas of hardstanding for waste management;
- Excavations for installation of associated drainage systems;
- Installation of surface water drainage systems; and
- Excavation and construction of new internal access roads

Operational Phase

11.70 Operational phase activities with the potential to affect water resources or flood risk include the following:

- Increase in impermeable area of the Site due to increased roof area and new areas of hardstanding;
- Discharge of increased volumes of surface water to surface watercourses;
- Generation and management of additional waste products; and
- Water consumption by future Site users.

Assessment of Effects on Water Resources

11.71 The methodology outlined above in this Chapter has been applied to each aspect of the Proposed Development with the potential to affect water resources or flood risk.

11.72 The receptors identified include:

(i) Three unnamed local watercourses A-C within the Site and Hey Beck which receive the surface water flows from the surrounding catchment and

(ii) The potential for surface water runoff to infiltrate into the ground due to the underlying geology. Please see Chapter 12 for the likely significant effects of the Proposed Development with respect to the WFD and ground conditions which includes potential land contamination impacts to groundwater and public water supply.

11.73 There are no residential or non-residential properties, environmental designations or other watercourse receptors identified at risk. The local watercourses all discharge into the Hey Beck prior to Fenton Dam. The dam has been developed as a flood protection scheme for the downstream Westgate End protecting Wakefield and potential downstream receptors.

11.74 Local watercourses A-C do not have WFD classifications and have no nature conservation designations. The Site has low aquatic flora and fauna biodiversity, no protected species aside from bats which use the Site for foraging and has no important social or economic uses such as water supply or navigation. Overall, the sensitivity of the local watercourses is considered to be **Low**.

11.75 During construction there are a number of potential effects that could impact the local watercourses and ultimately Hey Beck which are assessed and mitigation discussed below.

11.76 Inappropriate Wastewater Disposal from Welfare Facilities has been screened out as Construction Site foul water will not be discharged into a watercourse under any circumstances and therefore an effect on surface water is considered unlikely.

11.77 During operation the risk to these watercourses will be mitigated through implementation of the drainage recommendations set out in the Drainage Strategy, which are to be developed further during detailed design. The Drainage Strategy will limit surface water flows to the existing greenfield runoff rate (QBAR), up to the 1% AEP + 20% Climate Change (CC) event for the

school and employment areas and up to the 1% AEP + 40% CC event for the proposed residential zones through implementation of SuDS.

Construction Phase

Silt-laden Runoff

11.78 During the construction phases of the Proposed Development, there are a number of activities which have the potential to negatively affect the local water environment. Activities such as potential dewatering of excavations, concreting, earthworks, and use of heavy plant can lead to significant quantities of silty runoff that may also be contaminated with oil, fuel and/or other construction materials, all of which have potential to cause pollution of the water environment and negatively affect the ecology it supports. Pollutants could be mobilised to watercourses or indirectly (e.g. via uncontrolled surface water runoff).

11.79 The Proposed Development would involve construction of new internal access roads to the Proposed Development. Access roads are expected to be constructed with compacted self-binding aggregate fill materials. Shallow excavation of vegetation and soils would be necessary for laying of road surfaces. Access roads would form long linear features that, in the event of rainfall, could provide temporary drainage routes for surface water during the construction phase of the development. With the potential for soil erosion and consequent liberation of sediment from shallow road excavations it would be necessary to ensure that on-Site pollution prevention measures are adequate to prevent migration of silt to surface watercourses.

11.80 The potential for mud and debris to block drainage networks is considered to have an effect of **Minor Adverse** magnitude on flooding to the Site itself and surrounding area which would result in flood risk to people or property, if Fenton Dam was not present downstream. The significance of effect is therefore **Minor Adverse** on a temporary short-term basis.

Spillages, Leakages and Pollutants

11.81 During construction, fuel, hydraulic fluids, solvents, grouts, paints and detergents and other potentially polluting substances will be stored and / or used on Site. Leaks and spillages of these substances could pollute the nearby watercourses if their use is not carefully controlled and spillages enter existing flow pathways. To allow such substances to enter a watercourse could be in breach of the Water Resources Act, therefore, measures to control the storage, handling and disposal of such substances will need to be in place prior to and during construction. The construction compound locations have not been determined, nor has it been confirmed at this stage whether concrete will be batched off-Site. Therefore, it has been assumed that these could be sited next to existing watercourses. Without mitigation measures Site spillages of chemicals/fuel stored and or used on Site could cause short term, temporary effects of a **Moderate** magnitude on surface water and the watercourses. The significance of effect is **Moderate Adverse** on a temporary short-term basis.

Operational Phase

Diffuse Pollution Contained in Urban Runoff

11.82 The operation of the Proposed Development may negatively effect upon the local water environment. Urban runoff from the Site, along with the associated infrastructure, could contain diffuse urban pollutants such as hydrocarbons, heavy metals, and nutrients as well as debris and silt which could ultimately be discharged to the local watercourses via surface water runoff. This is considered to have an effect of **Moderate Adverse** magnitude on the local watercourses and downstream Hey Beck. The significance of effect is **Moderate Adverse** for these watercourses which is considered permanent if left unmitigated.

Increase in Highway Routine Runoff

11.83 Traffic on existing roads to and from the Site will increase as a result of the Proposed Development. Any increase in traffic flows could lead to the introduction of new sources (or changed discharges) of highway runoff into receiving watercourses. Surface water runoff from roads can contain pollutants such as hydrocarbons, heavy metals and inert particulates which

can cause chronic pollution of the water environment if allowed to enter watercourses without the appropriate treatment.

- 11.84 Without mitigation this could have a minor adverse effect on water quality. This is considered to have an effect of **Minor Adverse** magnitude on the watercourses. The significance of effect is **Minor Adverse** for the watercourses which is considered permanent if left unmitigated. Please see Chapter 13 for further information with regards to the transport assessment such as wider junction upgrades.

Increase in Highway Spillage Risk

- 11.85 Spillages of pollutants (e.g. oil, food produce) on highways can be transported to watercourses, via runoff, where they could impact upon ecological life. The assessment of effects on ecology is detailed in Chapter 14.

- 11.86 The Proposed Development is considered to have a minor adverse effect on water quality to the local watercourses (with regards to highway spillages). This is therefore considered to have an effect of **Minor Adverse** magnitude on the watercourses. The significance of effect is **Minor Adverse** for the watercourses which is considered permanent if left unmitigated.

Increased Demand on Water Supply

- 11.87 Due to the scale of the Proposed Development there will be an increased demand for water by residential and commercial occupiers. This will lead to increased pressure on local resources. This is not directly considered to be a surface water quality effect, as it is unlikely that water would be sourced from local surface waters, and it is presumed that the Proposed Development would not proceed unless potable water was available from elsewhere. Yorkshire Water should be consulted regarding potable supply to the Proposed Development which should be completed during detailed design. Water consumption for any future Site users should be minimised through efficiency measures.

- 11.88 It is considered that the Proposed Development has a **Negligible** effect on water supplies. (i.e. to locations where potable water supply is obtained from).

Disposal of Surface and Foul Water from the Site

- 11.89 Due to the scale of the Proposed Development there will be a need to dispose of surface water and foul water as a result, this can lead to increased pressure on the wider surface water and foul drainage network.

- 11.90 Separate systems of surface water and foul water will be provided on Site as detailed in the Drainage Strategy in Appendix 11.1.

- 11.91 Currently the surface water will partially infiltrate into the ground, however given the low permeability of the underlying ground, the surface water will largely follow topographic low points towards the local watercourses. The surface water drainage system will be designed to maintain current greenfield runoff rates and provide suitable SuDS with appropriate water quality benefits and treatment where possible before discharging to watercourse. Surface water flow is therefore proposed to not infiltrate into the ground or to sewer.

- 11.92 A 200 mm diameter pipe has been identified in the eastern boundary on the topographical survey, Watercourse B is shown to emerge from this pipe. A survey should also be carried out to identify the presence of existing drainage networks underlying the Site, this can also be undertaken during detailed design.

- 11.93 Subject to the drainage strategy developing during detailed design and implemented as part of the Proposed Development so as not to exacerbate risk locally or downstream, it is considered that the Proposed Development would have a **Negligible** effect on the Water Environment with regard to disposal of surface water.

- 11.94 Sewer Plans obtained from Yorkshire Water show a 900 mm public combined and 375 mm foul sewer to the east of the Site, flowing in a south-easterly direction parallel to the Site boundary and Hey Beck. Other sewers in the area include a 300 mm combined public sewer within Leeds Road and a 225 mm combined and foul sewer within Chidswell Lane.
- 11.95 Foul flows from the Site should be discharged to the 375 mm foul sewer or the 900 mm public combined sewer to the east of the Site boundary via a gravity fed system. A gravity fed system should be achievable given the local topography and situation of these sewers downgradient from the Site;
- 11.96 If a connection to the eastern sewer network is not feasible across the entirety of the Site, connections can be made to the sewers located within Leeds Road and Chidswell Lane, providing an alternative discharge point. A minimum cover level of 100.86 m AOD has been recorded along Leeds Road and 116.98 m AOD at Chidswell Lane, therefore a pumped connection to the sewers system is potentially required. This can be determined during the detailed design stage.
- 11.97 A survey of the public sewer system should be undertaken to determine invert levels and confirm that a gravity connection can be achieved.
- 11.98 A new connection to the sewer system will be required, Yorkshire Water should be contacted at the earliest opportunity, through a Developer Enquiry, to highlight any constraints involved in discharging via a new connection.
- 11.99 Operational foul water will not be discharged into a watercourse under any circumstances and therefore the magnitude of impact and significance of this effect is considered to be **Negligible**.

Summary

- 11.100 In summary, the main receptors at risk are local watercourses A-C including Hey Beck into which they drain along with surface water infiltrating into the ground. During construction there are a number of potential effects on surface water which require mitigation to reduce the residual effect to **Negligible** which is summarised below. During operation the risk to the local watercourses will be mitigated through implementation of SuDS summarised in Table 7.

Table 5 – Water Resources summary of likely significant effects and receptors at risk if left unmitigated

Likely Significant Effect	Receptor(s)
<i>Construction Phase</i>	
Silt-laden Runoff	Surface Water (leaching into ground) / Ordinary Watercourses A-C and Hey Beck
Spillages, Leakages and Pollutants	Surface Water (leaching into ground) / Ordinary Watercourses A-C and Hey Beck
<i>Operational Phase</i>	
Diffuse Pollution Contained in Urban Runoff	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck
Increase in Highway Routine Runoff	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck
Increase in Highway Spillage Risk	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck
Increased Demand on Water Supply	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck

Likely Significant Effect	Receptor(s)
Disposal of Surface and Foul Water from the Site	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck

Assessment of Effects on Flood Risk

11.101 As per the assessment of the effects on Water Resources, the receptors identified include:

- (i) Three unnamed local watercourses A-C within the Site and Hey Beck which receive the surface water flows from the surrounding catchment and
- (ii) The potential for surface water runoff to infiltrate into the ground due to the underlying geology. Please see Chapter 12 for the likely significant effects of the Proposed Development with respect to the WFD and ground conditions which includes potential land contamination impacts to groundwater and public water supply.

Construction Phase

Mud and Debris Blockages

11.102 There is the potential for mud and debris arising from the construction works to enter the existing surface water drainage system and watercourses, causing potential blockages and restrictions in flow. This could result in localised flooding on Site, especially after heavy or prolonged rainfall. As the Site is at present agricultural, the initial effect is considered to be limited. However, as the phased development of the Site progresses and surface water drainage networks are installed, this potential construction effect will become an increasing consideration. The potential for mud and debris to block drainage networks is considered to have an effect of **Minor Adverse** magnitude on flooding to the Site itself and surrounding area which would result in flood risk to future people or property at the Site without appropriate mitigation. The significance of effect is **Moderate Adverse**.

Temporary Increase in Impermeable Area

11.103 Temporary increase in impermeable area during construction has the potential to increase flooding both on and off Site. Temporary hard standing or compacted areas could result in rapid surface water runoff to the watercourses or cause an increase in overland flow. As the Site is greenfield at present there is potential for overland flows to be created and for localised flooding to occur. Increased, un-regulated discharges into local watercourses could also increase the risk of flooding downstream. The effects would be temporary and short term. temporary effects are considered to have an effect of **Moderate Adverse** magnitude to future people and property at the Site (considered to be up to very high importance and including construction workers and construction equipment) as it could occur at a time of high flood risk (e.g. during a large storm event). The significance of effect is **Moderate Adverse**.

Operational Phase

Increase in Permanent Impermeable Area

11.104 The Proposed Development will increase the permanent impermeable area on Site which will generate increased surface water runoff when compared to the current use of the Site. This could potentially increase localised pluvial flooding on Site, as well as increase flood risk to people and property in the immediate surrounding area and downstream. Whilst, the effects would be temporary and short term, this is considered to have an effect of **Moderate Adverse** magnitude to people and property (considered to be up to very high importance) as it could occur at time of high flood risk (e.g. during a large storm event). The significance of effect is **Major Adverse**.

Increase in Discharge to Local Watercourses

11.105 An increase in the volume of water discharged to local watercourses A-C and Hey Beck has the potential to increase the flood risk to the Site and downstream. The local watercourses all

discharge into the Hey Beck prior to Fenton Dam. The dam has been developed as a flood protection scheme for the downstream Westgate End protecting Wakefield downstream.

- 11.106 Whilst the effects would be temporary and short term, this is considered to have an effect of **Moderate Adverse** magnitude to people and property (considered to be up to very high importance) occurring at time of high flood risk (e.g. during a large storm event). The significance of effect is **Major Adverse**.

Blockage of Drainage Networks

- 11.107 There is potential for drainage networks to become blocked with debris from run off during the operation of the Site. This could cause localised pluvial flooding on Site as well as increase flood risk downstream as a result of increased run off to local watercourses, particularly after heavy or prolonged rainfall. Whilst the effects would be temporary and short term, this is considered to have an effect of **Moderate Adverse** magnitude to future people and property at the Site without appropriate mitigation (considered to be up to very high importance and including residents and their homes to be built as part of the Proposed Development) occurring at time of high flood risk (e.g. during a large storm event). The significance of effect is **Major Adverse**.

Summary

- 11.108 In summary, the main receptors at risk are the local watercourses A-C, including Hey Beck and the potential for surface water runoff to infiltrate into the ground. Receptors downstream of the Site, including Wakefield, are not considered a sensitive receptor as the Site is well defended by Fenton Dam and therefore not considered further. During construction there are a number of potential effects on surface water which require mitigation to reduce the residual effect to **Negligible** which is summarised below. During operation the risk to the local watercourses will be mitigated through implementation of SuDS summarised in Table 7.

Table 6 – Flood Risk summary of likely significant effects and receptors at risk

Likely Significant Effect	Receptor(s)
<i>Construction Phase</i>	
Mud and Debris Blockages	Surface Water (leaching into ground) / Ordinary Watercourses A-C and Hey Beck
Temporary Increase in Impermeable Area	Surface Water (leaching into ground) / Ordinary Watercourses A-C and Hey Beck
<i>Operational Phase</i>	
Increase in Permanent Impermeable Area	Surface Water (leaching into ground) / Ordinary Watercourses A-C and Hey Beck
Increase in Discharge to Local Watercourses	Surface Water (leaching into ground) / Ordinary Watercourses A-C and Hey Beck
Blockage of Drainage Networks	Surface Water (leaching into ground) / Ordinary Watercourses A-C and Hey Beck

Mitigation Measures

Mitigation associated with Water Resources

- 11.109 A number of key mitigation measures has been suggested in the sections below. It is likely that these will be formalised through the preparation of a Construction Management Plan (CMP) and Drainage Strategy which are anticipated to be secured by planning condition.
- 11.110 In summary, the mitigation below reduces the residual risk to **Negligible** for the local watercourse, including Hey Beck and surface water receptors, largely through appropriate SuDS, controlling flows into the receiving watercourses and downstream.

Construction

Silt-laden Runoff - Silt Management and Control

- Works that are likely to generate silt-laden runoff (e.g. earthworks and excavations) will be done preferentially during the drier months of the year;
- A buffer of 10 m should be preserved adjacent to all receptors to ensure that there is a sufficient buffer from the sensitive receptor to the construction stages of development;
- Site compounds and stockpiles will be located at least 30 m away from receptors;
- A drainage system will be developed to prevent silt-laden runoff from entering surface water drains and watercourses without treatment (e.g. earth bunds, silt fences, straw bales, or proprietary treatment) and ponds under any circumstances;
- Earth stockpiles will be seeded as soon as possible, covered with geotextile mats or surrounding by a bund;
- Mud will be controlled at entry and exits to the Site using wheel washes and / or road sweepers;
- Tools and plant will be washed out and cleaned in designated areas within Site compound where runoff can be isolated for treatment before discharge to watercourse/ground or sewer under appropriate consent;
- Debris and other material will be prevented from entering receptors;
- Where appropriate Site runoff containing silts will be spread across fields (to soakaway); and
- Construction SuDS (such as temporary attenuation) to be used during construction if necessary.

11.111 Following the implementation of the mitigation measures the residual effect is considered to be **Negligible**.

Spillages and Leaks of Pollutants

11.112 To allow chemicals, fuels/oils and other such substances to enter a water body could be in breach of the Water Resources Act 1991. As such measures to control the storage, handling and disposal of these substances will need to be put in place prior to and during construction. The following key mitigation measures relating to the control of spillages and leaks should be included in the CMP:

- Fuel will be stored and used in accordance with the Control of Substances Hazardous to Health Regulations 2002, and the Control of Pollution (Oil Storage) (England) Regulations 2001;
- Fuel and other potentially polluting chemicals are to be stored in a secure impermeable and bunded area;
- Refuelling of plant to take place off Site if possible, or only in a designated area at the Site compound at least 20 m from receptors;
- Any plant / machinery / vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off Site if possible or only at designated areas in the Site compound;
- All fixed plant used on Site to be self-bunded;
- Mobile plant to be in good working order, kept clean and fitted with drip trays where appropriate;
- An Emergency Response Plan will be prepared and included in the CMP. Spill kits and oil absorbent material to be carried by mobile plant and located at vulnerable locations on the Site. Construction workers will receive spill response training;
- The Site is to be kept secure to prevent vandalism that could lead to a pollution incident;
- Construction waste / debris are to be prevented from entering any water body;
- Surface water drains on roads, other watercourse crossings or the core scheme compound area will be identified and where there is a risk that silt laden runoff could enter them they will be protected (e.g. covers or sand bags); and
- Concrete wash water will be adequately contained and removed from Site.

11.113 Following the implementation of the mitigation measures the residual effect is considered to be **Negligible**.

Inappropriate Wastewater Disposal from Welfare Facilities

11.114 No mitigation required. The residual effect is considered to be **Negligible**.

Operation

Diffuse Pollution Contained in Urban Runoff

11.115 Generally, the Proposed Development is likely to have a very low or low pollution risk from roads and roofs and so the management train should normally have one or two treatment stages. Generally, two treatment stages to control pollution for run-off from drives and roads and one treatment stage for run-off from roofs, subject to agreement of the approving authority.

11.116 Where practical, at detailed design stage it is recommended that runoff from roofs and roads will be directed to permeable SuDS features with contributions being made from permeable pavements, swales and infiltration/detention basins.

11.117 Inclusion of a detention basin, pond and/or permeable paving should in general provide sufficient treatment. Where large areas of car parking are envisaged associated with commercial development, additional treatment may need to be provided by a suitably sized separator.

11.118 Maintenance of SuDS features may remain the responsibility of the management company or could be passed to the Highway Authority, Water Company or the Local Authority where relevant. Some small elements of SuDS may be within the ownership and therefore maintenance responsibility of individual householders. An overview of possible SuDS features and possible future maintenance are provided in the Drainage Strategy in Appendix 11.1.

11.119 Following the implementation of mitigation measures the residual effect is considered to be **Negligible**.

Increase in Highway Routine Runoff and Increase in Highway Spillage Risk

11.120 No mitigation required beyond what is proposed in Chapter 13 Transport. Mitigation may include adaptations to the highway design to include oil interceptors or similar; this would be confirmed at detailed design.

11.121 The residual effect is considered **Negligible**.

Increased Demand on Water Supply

11.122 No mitigation required. The residual effect is considered **Negligible**.

Disposal or Surface and Foul Water from the Site

11.123 No mitigation required. The residual effect is considered **Negligible**.

Mitigation associated with Flood Risk

Construction

Mud and Debris Blockages

11.124 A temporary drainage network will be installed prior to the commencement of construction and a robust maintenance plan, confirmed through a Construction Management Plan, should be maintained throughout the duration of construction works on Site. Following the implementation of mitigation measures the residual effect of mud and debris entering the surface water drainage system is considered Negligible.

Temporary Increase in Impermeable Area

11.125 Construction mitigation guidance should be adhered to, for example ensuring that Site impermeability is increased as little as possible ahead of drainage being installed. This effect should lessen as the Proposed Development progresses and the overall impermeable area increases with surface water drainage networks installed to deal with this effect. The residual effect, following the implementation of a temporary construction drainage network, is considered to be **Negligible**.

Operation

11.126 All post development surface water drainage from the Site will be designed to ensure there is no resultant risk of flooding to properties on Site, and no increased risk of flooding off Site during construction.

Increase in Permanent Impermeable Area

11.127 Surface water attenuation through the SuDS management train will be provided and controlled on Site by hydro-brake flow control devices (or similar) and surface water attenuation storage will be provided by retention basin; ponds; infiltration basins and other SuDS systems as suitable and determined during detailed design.

11.128 The SuDS management train comprises four stages, namely prevention, source control, site control and regional control. Runoff need not pass through all the stages in the management train. As with the Site, runoff will flow straight to site control and as a general principle it is better to deal with runoff locally, returning the water to the natural drainage system as near to the source as possible.

11.129 The SuDS will be developed as the development proposals develop and designed to the 1 in 100-year storm with the appropriate allowances for climate change and urban creep. Urban creep is the conversion of permeable surfaces to impermeable over time e.g. e.g. surfacing of front gardens to provide additional parking spaces, extensions to existing buildings, creation of large patio areas.

11.130 A robust SuDS maintenance plan should be produced and followed during the operation of the Site to minimise the risk of blockages and maintained for the lifetime of the development.

11.131 Following implementation of the proposed mitigation the residual effect is considered to be **Negligible**.

Increase in Discharge to Watercourse

11.132 The Drainage Strategy, contained in Appendix 11.1, concludes soakaways are unlikely to be suitable for the discharge of surface water runoff, which can be confirmed during detailed design by undertaking soakaway tests to BRE365 specification. Where soakaways are practical these should be used. Otherwise, discharge to local watercourses, via SuDS, will likely provide the method of disposal of surface water at the Site and designed appropriately so as not to exacerbate surface water risk to the Site. Suitability of the SuDS components using infiltration for the disposal of surface water should be developed further during the detailed drainage design for the Site.

11.133 Attenuation of the discharge rates, as far as practicable, to equivalent Greenfield runoff rates as calculated in accordance with The SuDS Manual (C753 CIRIA Guidance)) will be undertaken. Storage for additional flows up to the 1% AEP + 20% Climate Change (CC) event for the school and employment areas and up to the 1% AEP + 40% CC event for the proposed residential zones has also been provided in suitable SuDS features as part of the Drainage Strategy.

11.134 Surface water risk will be reduced / removed post development as land levelling activities during construction will redirect surface water towards proposed landscaped / impermeable areas and surface water risk will be managed with an appropriate drainage system. As greenfield runoff rates are to be maintained or improved upon, the proposed surface water drainage

scheme will ensure no increase in runoff over the lifetime of the development and will contribute to a reduction in flood risk off-Site during events in excess of the 1 in 2 year storm.

11.135 Following implementation of the proposed mitigation the residual effect is considered to be **Negligible**.

Blockage of Drainage Networks

11.136 The drainage system will be designed to good practice standards and the implementation of a robust maintenance plan will aid in ensuring that the risk of flooding as a result of blockages is reduced. Following the implementation of mitigation measures the residual effect is considered to be **Negligible**.

Cumulative Effects

11.137 This section assesses the interaction of the Proposed Development with other committed developments and any cumulative environmental effects. The chapter also considers the effects on individual receptors from multiple flood risk and drainage impacts arising from the Proposed Development

Future Residential Development at Hey Beck Lane

11.138 There is a risk of flood or surface flow from the future residential development at Hey Beck Lane. The topography of the Hey Beck Lane (HBL) site falls towards the proposed Site boundary. Therefore, during the construction phase, surface flows will be a risk. There will be a risk of increased surface water contribution due to the construction of impermeable areas such as access roads, driveways and roofs. Any flooding from Hey Beck Lane, if left unmitigated, will flow towards the commercial area at the northern boundary of the Site.

11.139 The HBL site and the proposed Site will both require a detailed Drainage Strategy designed to restrict the surface water run-off to greenfield rates and consider the cumulative impacts, there will be an overall betterment to the load and flows on the existing infrastructure and watercourses which be developed further during detailed drainage design. As impacts can be mitigated the cumulative impact is considered **Negligible**.

Barratt Homes Residential Development

11.140 A planning application has been submitted to Kirklees Council by Barratt Homes, for the construction of 252 residential properties at the southern border of the proposed Site. The Site is referred to as Land at Owl Lane (LaOW) and its topography also falls towards the proposed Site.

11.141 Foul and Surface water will discharge into the public sewer increasing flow capacity. Flood flow from the adoptable drainage network will flow towards the proposed Site, which could pose a risk to the residential properties on the southern boundary of the Site. Consultation with Yorkshire Water should be undertaken to ensure that the cumulative foul flows can be accommodated through a Developer Enquiry, including the potential future residential development at Hey Beck Lane.

11.142 The LaOS site and the proposed Site will both require a detailed Drainage Strategy designed to restrict the surface water run-off to greenfield rates and consider the cumulative impacts, there will be an overall betterment to the load and flows on the existing infrastructure and watercourses which be developed further during detailed drainage design. As impacts can be mitigated the cumulative impact is considered **Negligible**.

Residual Effects

11.143 As per the flood risk and drainage assessment detailed in this Chapter, the residual effects post-mitigation is considered **Negligible**. A summary of the receptors, likely significant effects, mitigation measures and residual effects are summarised below.

11.144 The main receptors at risk are local Watercourses A-C, Hey Beck and the potential for surface water runoff to infiltrate and leach into the ground. No existing residential or non-residential or other watercourse receptors are considered to be affected post development.

Table 7 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
<i>Water Resources</i>			
Construction Phase			
Silt-laden Runoff	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Silt Management and Control measures which are included in the CMP	Negligible Effect
Spillages, Leakages and Pollutants	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Measures to control the storage, handling and disposal of these substances will need to be put in place prior to and during construction included in the CMP	Negligible Effect
Operational Phase			
Diffuse Pollution Contained in Urban Runoff	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Inclusion of a detention basin, pond and/or permeable paving should in general provide sufficient treatment. Where large areas of car parking are envisaged associated with commercial development, additional treatment may need to be provided by a suitably sized separator. Completion of a robust SuDS maintenance plan.	Negligible Effect
Increase in Highway Routine Runoff	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	No mitigation required beyond what is proposed in Chapter 13 Transport	Negligible Effect
Increase in Highway Spillage Risk	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	No mitigation required beyond what is proposed in Chapter 13 Transport	Negligible Effect
Increased demand on Water Supply	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	No mitigation required	Negligible Effect
Disposal of Surface and Foul Water from the Site	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	No mitigation required	Negligible Effect
<i>Flood Risk</i>			
Construction Phase			
Mud and Debris Blockages	Surface Water (leaching into ground)	A temporary drainage network will be installed prior to the commencement of construction and a robust maintenance plan should be maintained throughout the duration of construction works on Site.	Negligible Effect

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
	Ordinary Watercourses A-C and Hey Beck		
Temporary Increase in Impermeable Area	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Construction mitigation guidance should be adhered to, for example ensuring that site impermeability is increased as little as possible during construction, thereby lessening as the Proposed Development progresses and the overall impermeable area increases with surface water drainage networks installed to deal with this effect.	Negligible Effect
Operational Phase			
Increase in Permanent Impermeable Area	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Surface water attenuation through the SuDS management train will be provided by hydro-brake flow control devices (or similar) and surface water attenuation storage will be provided by retention basin; ponds; infiltration basins and other SuDS systems as suitable and determined during detailed design.	Negligible Effect
Increase in Discharge to Local Watercourses	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Discharge to local watercourses, through the management train of a variety of SuDS components, will provide the method of disposal of surface water at the Site and designed appropriately so as not to exacerbate surface water risk to the Site.	Negligible Effect
Blockage of Drainage Networks	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	The drainage system will be designed to good practice standards and the implementation of a robust maintenance plan will aid in ensuring that the risk of flooding as a result of blockages is reduced and to maintain the features throughout the lifetime of the Proposed Development.	Negligible Effect

Summary

11.145 This Chapter of the ES has assessed the likely significant effects of the Proposed Development with respect to Flood Risk and Drainage, including the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.

11.146 The associated Flood Risk Assessment concludes that the baseline risk to the Site and the impact of the Proposed Development from all sources of flooding is considered **Low and Acceptable**. This includes surface water risk, assuming that an appropriate drainage system is further developed for the Site during detailed design in consideration for SuDS in line with CIRIA SuDS (C753) Guidance.

11.147 Surface water risk will be reduced / removed post development as land levelling activities during construction will redirect surface water towards proposed landscaped / impermeable areas and surface water risk will be managed with an appropriate drainage system. As greenfield runoff rates are to be maintained or improved upon, the proposed surface water drainage scheme will ensure no increase in runoff over the lifetime of the development and will contribute to a reduction in flood risk off-Site during events in excess of the 1 in 2 year storm. Additional recommendations are contained within Appendix 11.1.

11.148 The receptors identified at risk include the local watercourses A-C and receiving Hey Beck downstream and the potential for surface water runoff to infiltrate into the ground. There are no residential or non-residential properties, environmental designations or other watercourse receptors identified at risk. Please see Chapter 12 for the likely significant effects of the Proposed Development with respect to ground conditions and contamination.

- 11.149 In summary, local watercourses A-C do not have a WFD classification and has no nature conservation designations. The Site has low aquatic flora and fauna biodiversity and no protected species aside from bats which use the Site for foraging and has no important social or economic uses such as water supply or navigation. The Site is in Flood Zone 1 and therefore has a Very Low probability of flooding of residential or non-residential properties, however there is the potential for significant effects during construction and operation that require potential mitigation.
- 11.150 In summary, the main significant effects at the Site revolve around dealing with surface water risk at the Site and the potential for silt laden runoff, spillages, leaks and pollutants during the construction stage and diffuse pollution contained in urban runoff during the operation phase from a water resource perspective. In addition, from a flood risk perspective, the significant effects include mud and debris blockages and temporary increases in impermeable areas during the construction phase and the increase in permanent impermeable area and increase in discharge to ground and blockages of drainage networks during the operational phase.
- 11.151 Mitigation includes completion of a CMP which will include details of mitigation measures to prevent adverse impacts occurring to controlled waters and SuDS measures to mitigate the surface water risk which will develop as the design continues to develop. Generally, the Proposed Development is likely to have a very low or low pollution risk and so the management train should normally have one or two treatment stages. Generally, two treatment stages for run-off from drives and roads and one treatment stage for run-off from roofs, subject to agreement of the approving authority. Inclusion of a retention basin, pond and/or permeable paving should in general provide sufficient treatment, however swales and filter drains also provide additional water quality benefits.

12 Contamination

Introduction

- 12.1 This Chapter of the Environmental Statement (ES) has been prepared by Jonathan Roberts, Principal Geo-environmental Engineer (CGeol, MSc, BSc) of Patrick Parsons.
- 12.2 This Chapter assesses the likely significant effects of the Proposed Development with respect to contamination. This chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 12.3 This Chapter is accompanied by two technical appendices, a Phase 1 Geo-environmental Desk Study Report (DTS) – Heybeck Lane and Land to the East of Leeds Road, Chidswell Patrick Parsons Ltd, Report Ref. H18017 Rev. 3, December 2019 (Appendix 12.1) and a Coal Mining Risk Assessment (CMRA) Land East of Leeds Road Chidswell, Dewsbury Patrick Parsons Ltd, Report Ref. H18199B CMRA Rev. 2, December 2019 (Appendix 12.2).
- 12.4 The principal objective of the assessment is to provide statutory and non-statutory consultees with sufficient technical information on contamination to gain a comprehensive understanding of the Proposed Development. Specific aims of the assessment are to:
- Assess the types and occurrences of soil and rock strata beneath the Site;
 - Assess the type and level of soil and groundwater contaminants beneath the site, using currently available information;
 - Identify potential receptors that are likely to be at risk from identified potential contaminants;
 - Evaluate the significance of risk posed to the identified receptors;
 - Consider the impacts on surface water quality from the Proposed Development;
 - Where necessary make recommendations for mitigation measures to: 1) address the risk from contamination to the identified receptors; and 2) address any unacceptable historic mining features in the vicinity of the Proposed Development; and
 - Consider any potential requirement for additional ground investigations and ground engineering/treatment prior to construction

Legislative and Policy Context

Legislation

- 12.5 The majority of the Site is a greenfield site that has not previously been developed. The development of greenfield sites must be in accordance with UK legislation, policy and statutory guidance and the following has been considered relevant to this assessment.

Environmental Protection Act 1990 Part 2A

- 12.6 Part 2A was introduced into the Environmental Protection Act (EPA) 1990 by the Environmental Act 1995 to help deal with the substantial legacy of contaminated land. Part 2A, its accompanying regulations and Statutory Guidance contained in DETR Circular 02/2000 Contaminated Land came into force in England on 1 April 2000. Part 2A included the first statutory definition of “contaminated land” and conferred new responsibilities and powers on local authorities and the Environment Agency (EA) to identify contaminated land and ensure that it is dealt with. The Department for Environment, Food and Rural Affairs (Defra) published updated guidance in April 2012 (Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance). Further industry guidance is provided within the British Standards Institution (BSI) BS10175:2011+A1:2013 ‘Investigation of Potentially Contaminated Sites – Code of Practice’ and Environment Agency publication CLR11 (2004) ‘Model Procedures for the Management of Land Contamination’.
- 12.7 Within Part 2A, contaminated land is defined as: “any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land that:
- Significant harm is being caused or there is a significant possibility of such harm being caused; or
 - Significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused.
- 12.8 Part 2A addresses “unacceptable risk”. The approach is based upon the principles of risk assessment, including the concept of a contaminant, a receptor and a pathway, which, if combined, form a pollutant linkage. These and other key terms are defined in Part IIA and in the Guidance. A significant pollutant linkage forms the basis of a formal determination that land is contaminated land.
- 12.9 For each receptor, a description of the harm that is to be regarded as significant harm for the purposes of the regime is contained in the Guidance. Receptors include human beings, ecological systems in certain protected locations (e.g. sites of special scientific interest), property such as crops, livestock, domesticated animals and buildings and their services. Significant harm includes in appropriate cases death, disease, serious injury, specified ecological system effects, substantial diminution of crop yield and structural building failure. Pollution of controlled waters arising from the contaminated condition of land is also included in the regime.

Water Framework Directive 2000/60/EC

- 12.10 The European Union Water Framework Directive (WFD) aims to ensure that all surface water and groundwater reaches ‘good’ status (in terms of ecological and chemical quality and water quality as appropriate), promotes sustainable water use, reduce pollution and contribute to the mitigation of flood and droughts. The WFD is implemented in England by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.
- 12.11 The European Union Groundwater Directive 2006/118/EC aims to set groundwater quality standards and introduce measure to prevent or limit pollutants entering groundwater, including those listed with the ‘List of Priority Substances’.

National Planning Policy

- 12.12 National planning policy is set out within the National Planning Policy Framework (NPPF) 2019. This assessment refers to the following paragraphs within the NPPF:

12.13 Paragraph 170: Planning policies and decisions should contribute to and enhance the national and local environment by:

- protecting and enhancing values landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- 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;
- minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

12.14 Paragraph 175: When determining planning applications, local planning authorities should apply the following principles:

- 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;
- development on land within or outside a Site of Special Scientific Interest (SSSI), 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;
- 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
- 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.

12.15 Paragraph 178: Planning policies and decisions should also ensure that:

- a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);
- after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

- adequate site investigation information, prepared by a competent person, is available to inform these assessments.

12.16 Paragraph 179: Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Local Planning Policy

12.17 Kirklees Metropolitan District Council (KMDC) Local Plan (LP) sets out policies with regard to development across the district and was adopted in February 2019. These policies are designed to locally implement national and regional government planning policies.

12.18 KMDC's vision statement, in part, identifies the following:

A strong and sustainable economy - The key to achieving a thriving economy is through sustainable development. KMDC includes at its heart the principles of economic, social and environmental needs with the aim of planning to 'ensure that sufficient land of the right type is available in the right places at the right time to support growth and innovation support strong, vibrant and healthy communities and providing the supply of housing required to meet the needs of present and future generations contribute to protecting and enhancing our natural, built and historic environment minimise waste and pollution'

12.19 A part of the strategic objectives of KMBC is "Promote the re-use of existing buildings and the use of brownfield land to meet development needs and support the regeneration of areas".

12.20 "Contaminated land in Kirklees is largely a consequence of its industrial history, including past mining activity, but it can also arise from natural geology as well as from human activities and invasive species. Similarly, instability may have various causes, but the main concerns relate to past mining activity and there are extensive areas of recorded mining activity where coal mining related hazards will be present. Whilst most past mining is benign in nature potential public safety and stability problems can be triggered and uncovered by development activities."

12.21 KMDC Local Planning Policy LP53 states "For developments identified as being at risk of instability, or where there is evidence of contamination, measures should be incorporated to remediate the land and/or incorporate other measures to ensure that the contamination/instability does not have the potential to cause harm to people or the environment. Such developments which cannot incorporate suitable and sustainable mitigation measures which protect the well-being of residents or protect the environment will not be permitted."

12.22 Planning applications also acknowledge the implications of contaminated land: "To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner".

Assessment Methodology and Significance Criteria

12.23 The assessment of contamination has involved the review and collation of readily available information pertaining to the current conditions of the underlying geological sequence and water resources, i.e. groundwater and surface water courses. This information has been used to characterise baseline conditions for the Site.

12.24 The information has been reviewed in the context of the Proposed Development to evaluate the short, medium and long term, direct and indirect impacts.

Assessment Methodology

12.25 This assessment is based upon a review of current and historical environmental and geological data and information collected during the development of the Phase 1 Geoenvironmental Desk Study Report and Coal Mining Risk Assessment. The primary sources of information are listed below, and these provide reference to statutory and other environmental information:

- Patrick Parsons Limited, Phase 1 Geo-environmental Desk Study Report – Heybeck Lane and Land to the East of Leeds Road, Chidswell. Ref: H18017 Rev. 3, dated December 2019 (included as Appendix 12.1); and
- Patrick Parsons Limited, Coal Mining Risk Assessment – Land East of Leeds Road, Chidswell, Dewsbury. Ref: H18119B CMRA Rev. 2, dated December 2019 (included as Appendix 12.2).

12.26 The methodology for the assessment is based on a combination of the sensitivity and magnitude to determine the significance of the impact. These are based on the professional judgement of the team undertaking this assessment. The sensitivity and magnitude criteria are set out in Tables 12.1 and 12.2 below.

Table 12.1 – Contamination Impact Magnitude Classification

Impact Magnitude	Guideline Criteria
Major	Total loss of, or alteration to, the baseline resources such that post development characteristics or quality would be fundamentally and irreversibly changed
Moderate	Loss of, or alteration to, the baseline resource such that post development characteristics or quality would be partially changed
Minor	Small changes to the baseline resource, which are detectable, but the underlying characteristics or quality of the baseline situation would be similar to pre-development conditions
Negligible	A very slight change to the baseline conditions, which is barely distinguishable, and approximates to a 'no change' situation

Table 12.2 – Contamination Sensitivity Classification

	Sensitivity Criteria		
	High	Moderate	Low
Geology & Soils	Site of Special Scientific Interest (SSSI) Regionally Important Geological Sites (RIGS) Best and most versatile agricultural land	Outcropping bedrock Soils capable of supporting arable agriculture Thin upland soils Peat deposits Shallow coal seams	Soils capable of supporting grazing pasture Thicker lowland soils Soils within urban / developed areas Deep coal seams
Contaminated Land	Highly contaminated sites with shallow contamination	Contaminated sites with shallow contamination	Sites with low levels of contamination and / or contamination at depth

Significance Criteria

12.27 The significance criteria which have been developed to help in ascertaining the scale of effect (i.e. major, moderate, minor) and the type of effect (i.e. beneficial, negligible, or adverse) and are based on the professional judgement of the team undertaking this assessment. They provide a transparent and auditable decision making process to the reader are detailed in Table 12.3, below.

Table 12.3 – Significance Criteria

Significance Criteria	Description of Criteria
Major beneficial	An improvement to both the on-site and off-site ground conditions
Moderate beneficial	Significant improvement to the on-site ground conditions
Minor beneficial	Improvement to the on-site ground conditions
Negligible	No change to soil or water quality or harm caused to identified receptors
Minor adverse	Non-permanent effects on human health (easily prevented by standard personal protective equipment) Minor pollution of non-sensitive controlled waters receptors Non-significant harm to buildings, structures and services, but may result in financial loss or expenditure to resolve Minor harm caused to statutory designated sites (e.g. SSSI, RIGS etc) Sterilisation of low quality mineral resource
Moderate adverse	Chronic (and / or acute) risk to human health, but not likely to result in 'significant harm' Pollution of sensitive controlled waters receptors Damage to buildings, structures and services Sterilisation of significant mineral resource
Major adverse	Chronic (and / or acute) risk to human health likely to result in 'significant harm' Significant pollution of sensitive controlled waters receptors Significant harm caused to statutory designated sites (e.g. SSSI, RIGS etc)

12.28 Table 12.4 shows the significance assessment methodology used to derive the level of significance, based on the professional judgement of the team undertaking this assessment.

Table 12.4 – Contamination Impact Significance Matrix

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial	Major -Moderate Adverse/Beneficial	Moderate-Minor Adverse/Beneficial
Moderate	Major -Moderate Adverse/Beneficial	Moderate-Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate-Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor Adverse/Beneficial
Negligible	Negligible	Negligible	Negligible

Limitations and Assumptions

12.29 It should be noted that this assessment has been made using readily available desk-based information and a site walkover only. However, given that the site is predominantly greenfield with prior understanding of coal mining legacies gained to date, an adequate assessment has been achieved.

12.30 Intrusive ground investigations have not been commissioned as part of this assessment and no previous ground investigation information has been provided to confirm ground conditions beneath the Site. However, limited intrusive exploratory investigation findings specific to the underlying coal seams beneath the Site have been consulted.

Baseline Conditions

12.31 The findings of the Phase 1 Geo-environmental Desk Study Report and Coal Mining Risk Assessment (CMRA) are summarised below:

- The majority of the Site has remained as agricultural land (arable and pasture) since prior to the earliest edition Ordnance Survey (OS) Plans (1854-1855). However, there are signs of mining related infrastructure including 3 former mine shafts within the northeastern part of the Site, surface evidence of historic bell pits in the southwestern corner and former opencast mining adjacent to the Site's southeastern boundary;
- Natural superficial drift deposits are indicated to be absent from across the Site;
- The solid strata directly beneath the Site comprise sandstone, mudstone and siltstone of the Carboniferous Middle Coal Measures Formation, with a number of outcropping coal seams and fault blocks noted to be present across the Site;
- Bedrock beneath the site has been designated as a Secondary A Aquifer. The Site is not located within a groundwater source protection zone;
- A significant part of the Site is within areas of probable past shallow coal mining together with substantial parts being within Development High Risk Areas (DHRA). The Coal Authority (CA) define a DHRA as "the part of the coal mining reporting area which contains one or more recorded coal mining related features ie. mine entries, shallow coal workings (recorded and probable), recorded coal mining related hazards, recorded mine gas sites, fissures, breaklines and previous surface mining sites". Recorded shallow coal mining is present beneath the central northern part of the Site;
- Several surface watercourses, including a stream and drainage ditches, are present within the boundaries of the Site. These are indicated to generally flow in an easterly direction and discharge into Hey Beck which is located approximately 220m from the eastern boundary of

the Site. Hey Beck is designated as a Secondary River with all remaining watercourses designated as Tertiary;

- Dum Wood and Dogloitch Wood, both of which are located in close proximity to the Site, are designated as Ancient Replanted Woodland. There are no other Designated Environmentally Sensitive Sites within 2000m of the Site. Designated Environmentally Sensitive Sites belong to Designated Environmentally Sensitive Areas (DESA), which are defined as agricultural areas which need special protection because of their landscape, wildlife or historical value; and
- Due to the greenfield undeveloped nature of the majority of the Site, the risk of significant contamination that could affect future workers, end-users or controlled waters is considered negligible. However, localised areas associated with mining legacy infrastructure, may pose a risk.

Site Walkover Survey

12.32 A site walkover survey was undertaken in February 2018 and a detailed summary of findings is presented within the Phase 1 Geo-environmental Desk Study Report as referenced above and included as Appendix 12.1.

Current and Surrounding Land Use

12.33 The Site currently comprises a network of undulating agricultural fields with hedgerows, surface watercourses and drainage ditches. No significant development is currently present across the Site.

12.34 The north of the Site is bound by Dum Wood, which is listed as ancient woodland. The majority of the land adjacent to the western site boundary is occupied by existing residential development along Leeds Road and Chidswell Lane. Open fields with hedgerows and drainage ditches and Dogloitch Wood, also listed as ancient woodland, form the southern and south-eastern Site boundaries respectively. Likewise, the eastern Site boundary is defined by open fields and surface watercourses.

Geology

12.35 The geology at the Site has been determined by a review of published data (including online and hard copy mapping); British Geological Survey (BGS) Sheet SE22SE 1:10,000 scale Solid and Drift Edition; Sheet 78, Wakefield 1:50,000 scale Solid and Drift Edition and Sheet 232SE, Batley, 1:10,560 County Series 2nd Edition Solid and Drift. In addition, reference has been made to the following publications; Geological Survey Memoir 'Geology of the Country Around Wakefield', Sheet 78, 1940; BGS Technical Report WA/96/17, 'Geology of the Ossett Area', Lake RD, 1996 and RJB Mining (UK) Ltd 'Windsor Proposed Opencast Coal Site – Environmental Statement and Supporting Information', July 1997.

12.36 Made ground is not recorded to be present across the Site. However, in areas of the Site where historical mining infrastructure was located, associated made ground deposits may be present, including colliery spoil.

12.37 Geological plans indicate that superficial drift deposits are absent from across the Site. Residual cohesive and granular subsoils and cultivated soils associated with agricultural use, are likely to be present across the site.

12.38 The solid geology beneath the whole area of the Site comprises Carboniferous age strata of the Pennine Middle Coal Measures Formation which typically comprises a repeating succession of sandstone, mudstone, siltstone and coal seams.

12.39 Several geological faults are recorded to be present beneath the southern section of the Site.

Coal Mining Geology

- 12.40 Areas of the site are located within a CA DHRA with both recorded and probable unrecorded shallow coal workings indicated on BGS and CA mapping. The Chidswell colliery was present just beyond the Site's western boundary and the Babes in the Wood colliery was located to the north of the Site with several other collieries present in the surrounding area.
- 12.41 The Warren House, Beck Bottom Stone, Gawber and 27 Yard coal seams outcrop within the Site and these, together with the Swallow Wood and Haigh Moor coal seams, all underlie the Site at shallow depth.
- 12.42 A significant area of the Site itself is the subject of an historic licenced area (including a lesser adjacent area to the north and a larger adjacent area extending south and southeast) for the extraction of coal by opencast methods named the Windsor opencast Site. Work at the Windsor opencast site was never commenced.
- 12.43 The Site is unaffected by former opencast coal workings. The surrounding area has been historically intensely mined by opencasting methods for the numerous shallow coal seams present.

Hydrogeology

- 12.44 The solid geology beneath the Site is designated as a Secondary A Aquifer by the Environment Agency.
- 12.45 Secondary A Aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases form an important source of base flow to rivers. Due to the absence of natural superficial deposits across the Site, there is no aquifer designation for them.
- 12.46 The Site does not lie within a groundwater source protection zone and no groundwater abstraction licenses are present within 1km of the Site boundary. There are no records of springs or wells within the boundaries of the Site.

Hydrology

- 12.47 Hey Beck, which flows from northwest to southeast, is present approximately 220m to the east of the Site at its closest point.
- 12.48 Several surface watercourses including streams and drainage ditches are present across the Site. These are all indicated to flow towards the east and discharge into Hey Beck.
- 12.49 There are no surface water discharge consents located within the boundaries of the Site. However, there are 3 that are listed within 250m of the Site, 2 of which are operational and relate to the discharge of storm sewage overflows into the River Sheaf and Hey Beck. The revoked consent relates to discharge of trade effluent from Haigh Hall Opencast into Hey Beck.

Coal Mining*General*

12.50 Research of historical mining and associated legacies is based on an examination of the published topographical and geological information together with the review of a CA Consultants Coal Mining Report (ref: 51001875762001, dated 12 July 2018) for the Site, a CA Shaft Plan and Data Sheets, (ref. 51001875762002, dated 12th July 2018) for the Site, CA Abandonment Plans, 'Top Haigh Moor Coal Seam Underground', Plan Ref. 10091 and 'Tufty Farm Extension Opencast', Plan Ref. NE771 and specifically Site specific intrusive investigation data as summarised in Section 2.5 Geology (including Fig. 2 Geological Plan and Fig. 3 Generalised Geological Vertical Section) of the RJB Mining (UK) Ltd 'Windsor Proposed Opencast Coal Site – Environmental Statement and Supporting Information', July 1997.

12.51 The risk rating definitions with respect to the baseline coal mining legacy conditions at the Site are presented in Table 12.5 below. These are as referenced in the CMRA and are based on the professional judgement of the team undertaking this assessment.

Table 12.5 – Coal Mining Legacy Risk Magnitude Classification

Risk Impact Magnitude	Guideline Criteria
High	It is likely that significant harm to development or human health will occur unless appropriate remedial measures are incorporated into the development
Moderate	It is possible that significant harm to development or human health could occur depending on Site specific circumstances. Remedial measures may be required as part of the development to mitigate potential risks
Low	Not likely to cause significant harm to development or human health. Remedial measures are not likely to be required

12.52 Coal mining legacies associated with the Site, as identified within the CMRA, are summarised in Table 12.6 below.

Table 12.6 – Coal Mining Legacy Hazards

Coal Mining Hazard	Risk Rating
Shallow Mining (recorded)	High
Shallow Mining (probable)	High
Mine Entries	High
Mine Gases	Moderate to High
Surface Mining	Moderate

12.53 The pertinent findings of the CMRA are summarised below, itself included as Appendix 12.2.

Recorded and Probable Underground Shallow Coal Mining

12.54 Underground mine workings within the Top Haigh Moor coal seam are recorded at shallow depth (<30m) beneath the Site. Earlier exploratory drilling at the Site (as part of the proposed Windsor OCCS investigations) has confirmed the presence of past mine workings within both the Warren House Rider and Warren House coal seams. The west/southwestern and south-eastern parts of the Site are assessed as being underlain by probable historic shallow mine workings most likely associated with the Warren House Rider and Warren House, Beck Bottom Stone, Gawber, 27 Yard and Swallow Wood coal seams. Figure 12.1 indicates the recorded outcrop of coal seams across the Site together with preliminary areas that may be regarded as potentially unstable at the surface, as a consequence of probable shallow coal mining, subject to confirmation by intrusive investigation. The risk is assessed as **High**.

Surface Workings

12.55 The Site itself is unaffected by recorded former opencast coal workings. The surrounding area has been intensely historically opencast for the numerous shallow coal seams present. Former opencast coal sites include the Solway OCCS approximately 450m northwest, the Tufty Farm OCCS approximately 400m east, the Tufty Farm Extension OCCS adjacent to the south-eastern Site boundary and the Nook OCCS >1km northeast. The risk is assessed as **Moderate**.

Mine Entries

12.56 The recorded presence of 3 no. former mine entries (shafts) on the Site together with the potential for other unrecorded mine entries to be present on the Site itself, present a potential risk to development by way of surface instability, potential collapse and movement of mine gases. These recorded former mine entries are shown on Figure 12.1 together with their potential zones of influence, assuming 10m departure from their recorded positions. The risk is assessed as **High**.

12.57 Evidence at the surface of past mining by bell pits is recorded on the Site. This is confined to the southwestern corner and associated with historic exploitation of the Warren House and Warren House Rider coal seams. In addition, within the eastern part of Dogloitch Wood and immediately east of the Site, further evidence of historic bell pit mining is noted and associated with the exploitation of the Beck Bottom Stone coal seam. Again, these areas of former shallow mining as evidenced at the surface are presented on Figure 12.1.

12.58 Additionally, 2 no. former mine entries (shafts) are present off-site within approximately 75m of the western Site boundary.

Mine Gas

12.59 Both recorded and probable unrecorded shallow and recorded deep mine workings beneath the Site together with recorded and unrecorded former mine entries within the Site will collectively give rise to the potential of mine gas emissions migrating to the surface and posing a human health risk to Site end users and the Proposed Development. The risk is assessed as **Moderate to High**.

Ground Stability / Subsidence and Natural Geological Hazards

12.60 Geological hazards across the Site have been identified within the Emaphsite Report (included in the Phase 1 Geoenvironmental Desk Study Report), these are summarised in Table 12.7 below.

Table 12.7 – Natural Geological Hazards

Geological Hazard		Hazard Potential
Stability Hazards	Collapsible rock	Very low

	Compressible ground	Moderate
	Ground dissolution	Negligible
	Landslides	Moderate
	Running sand	Low
	Shrinking or swelling clay	Very low
Radon Affected Areas	The Site is located within a Radon Affected Area as between 3% and 5% of properties are above the action level	
Radon Protection Measures	Basic radon protection measures are required in the construction of new properties on the Site	

12.61 Consideration of the hazards identified above will be made in the design of ground investigation works required for the Proposed Development. The final design of ground works including earthworks, dewatering, foundation design and construction etc. will incorporate suitable mitigation based on the findings of the intrusive ground investigation works.

Landfill Sites and Waste Management Facilities

12.62 There are no records of landfill sites or other waste management facilities within the boundaries of the Site.

12.63 The nearest recorded landfill site, Shaw Cross Landfill Site, is located approximately 290m to the southwest of the Site. Details indicate that this landfill site accepted inert, industrial, commercial and household waste until 1991 when the licence was surrendered.

Previous Intrusive Ground Investigation

12.64 Several phases of past exploration to inform the reserves of shallow coal seams beneath the site and for the purposes of potential opencasting operations are known to have taken place across the Site during the 1950s to the 1990s. However, no previous intrusive ground investigations specifically for redevelopment purposes are known to have been undertaken within or within close proximity to the Site as part of the Proposed Development works.

12.65 No visual or olfactory evidence of significant contamination was noted during the Site walkover survey.

Identification and Evaluation of Likely Significant Effects

12.66 This assessment discusses the potential key impacts of the Proposed Development on the existing ground conditions beneath the Site. In addition, this assessment considers the effects of any potential identified sources of contaminants in relation to the Proposed Development. The assessment considers impacts during both the construction and operational phases.

Assessment of Construction Effects

12.67 The impacts of the construction phase of the Proposed Development have been assessed based on the known ground conditions and are based on the professional judgement of the team undertaking this assessment. The assessment has concluded that the environmental impacts brought about by the construction phase are short-term and temporary in nature, as they will only occur during construction.

Table 12.8 – Assessment of Significance of Potential Impacts during Construction

Potential Impact	Applicable Part of Site/Receptor	Direct/Indirect Effect	Significance of Unmitigated Impact
[1] Permanent loss of soils/natural strata and minerals through construction/excavation. In particular, the sterilisation of shallow coal reserves as a consequence of development	Whole site	Direct	Minor adverse
[2] Introduction of additional contamination into soil, surface and groundwater during construction phase as a result of accidental spillages i.e. fuels and construction materials	Whole site	Direct	Minor adverse
[3] Introduction of silt and construction contaminants or other debris during excavation or from uncontrolled site runoff into streams and drainage channels which discharge into Hey Beck	Controlled waters	Direct and indirect	Moderate adverse
[4] Impact on construction workers as a result of excavation into potentially contaminated soil/groundwater i.e. made ground, where present	Construction workers	Direct	Minor adverse
[5] Impact on construction workers as a result of excavations into and treatment of unrecorded unstable mining features i.e. shafts and unrecorded shallow coal workings	Construction workers	Direct	Moderate adverse
[6] Impact on construction workers and site neighbours from the generation of dust from excavation and stockpiling of construction materials including made ground and natural soils	Construction workers, site neighbours	Direct	Minor adverse

Assessment of Operational Effects

12.68 The impacts of the operational phase of the Proposed Development have been assessed on ground conditions. The assessment has concluded that the environmental impacts brought about by the operational phase are long-term and considered permanent in nature.

Table 12.9 – Assessment of Significance of Potential Impacts during Operation

Potential Impact	Applicable Part of Site/Receptor	Direct/Indirect Effect	Significance of Unmitigated Impact
[7] Introduction of contamination into soil, surface and groundwater as a result of accidental spillages/leakage from vehicles (site users and delivery vehicles) during the operational phase	Whole site and surrounding area	Direct	Minor adverse
[8] Introduction of contamination into soil, surface and groundwater as a result of accidental spillages/	Northern and eastern areas of Site	Direct	Minor to Major adverse (depending upon the type and

leakage from the storage of raw materials, bulk fuels and liquids within the employment zone during the operational phase			size of the pollution)
[9] Degradation of building materials and buried services over time e.g. as a result of contact with sulphate within soils and low pH	Proposed buildings, concrete substructures	Direct	Minor adverse
[10] Impacts on buildings and substructures as a result of unstable ground (mining features, shafts, shallow workings etc.)	Proposed buildings, substructures	Direct	Moderate adverse
[11] Impact on future Site occupiers as a result of hazardous ground gas	Future occupiers, site users	Direct	Substantial adverse

Mitigation Measures

12.69 The following mitigation measures will be designed into the Proposed Development in order to reduce potentially adverse effects and enhance beneficial effects caused by the Proposed Development.

Construction Phase

[1] Permanent loss of soils/natural strata and minerals through construction/excavation:

12.70 The construction of proposed commercial/industrial, retail, service and educational structures, residential dwellings with associated driveways, roads, areas of hardstanding and infrastructure will result in the direct loss of agricultural land.

12.71 The effects can be reduced by the good management of materials on Site including the reuse of suitable subsoil and topsoil in private gardens and soft landscaping areas.

12.72 The CMRA indicates that part of the coal reserves beneath the Site have historically been worked. There is evidence of significant quantities of coal reserves under the footprint of the Proposed Development, which could lead to a semi-permanent sterilisation of potentially available mineral reserves.

12.73 The coal reserves are considered to be of **Low to Moderate** sensitivity due to their potential economic use. The magnitude of the impact is assessed as **Moderate** and the significance of the effect of loss of soils/natural strata and minerals is therefore overall considered to be **Minor adverse**.

12.74 It is considered unlikely that prior extraction of these shallow coal reserves ahead of development of the Site will take place, given the government's UK energy policy and promotion of renewable energy sources. As such, these coal reserves will remain intact for possible future exploitation and will result in a neutral environmental benefit.

12.75 There are potential adverse effects of such activities need to be considered as part of the overall construction phase of the Proposed Development. Should this coal reserve remain unmined and unused, then this should be seen as a substantial benefit in the context of avoiding the scenario of an opencast coal mine, loss of soils and emissions associated with extraction, distribution and coal fired power generation.

12.76 The Site is allocated for mixed use development in the Local Plan and is in the interests of the district and the wider Leeds City Region, in terms of employment opportunities and contributing to housing requirements.

12.77 Following implementation of the above mitigation measures with respect to soils and the retention of shallow coal reserves for possible future exploitation, the significance of this impact can be assessed as **Negligible**. Therefore, the overall significance of the effects has been assessed as **Negligible**.

[2] Introduction of additional contamination into soil, surface and groundwater during construction phase as a result of accidental spillages i.e. fuels and construction materials:

12.78 During the construction works, there is a low risk of accidental spillage/leakage of materials and/or liquids. The overall significance is assessed as **Minor adverse**.

12.79 To mitigate the adverse effects of accidental leaks and spillages from construction plant during excavation and remediation works, including washing of vehicles and refuelling of plant etc., stringent control measures will be put in place under a Construction Environmental Management Plan (CEMP). These may include, but are not limited to:

- Storage of hydrocarbon or chemical products in bunded, double skinned tanks
- Consideration of the use of bio-fuels and lubricants
- Banning of on-site vehicle maintenance
- Registering all potentially harmful substances brought onto site and undertaking suitable environmental risk assessments following best practice

12.80 Following implementation of the above mitigation measures the probability of occurrence for this impact can be reduced to unlikely. Therefore, the significance of the effect can be assessed as **Negligible**.

[3] Introduction of silt and construction contaminants or other debris during excavation or from uncontrolled site runoff into streams and drainage channels which discharge into Hey Beck:

12.81 During the construction works, there is a moderate risk of pollutants (silt) entering Hey Brook via surface watercourses and drainage ditches located within the Site boundaries, during excavation and development works, including uncontrolled excess surface water runoff entering the surface water network. The overall significance is assessed as **Moderate adverse**.

12.82 To mitigate the adverse effects of fines (clay, silt and sand size particles) entering the surface watercourses and ultimately Hey Beck stringent controls and mitigation measures will be required to be in place prior to major excavation or development works from being undertaken under a CEMP. These may include but are not limited to:

- Obtain agreement of proposed works and proposed implementation measures and appropriate permits from governing bodies (e.g. Environment Agency) for any potential surface water discharge requirements
- Implementation of surface water control measures of sufficient capacity to deal with site operations and intercept or prevent site runoff
- Establish emergency protocols to deal with and address any failure in the proposed system (e.g. damage during a flood event etc.)

- Validation of the effectiveness of the installed measures during the course of the works

12.83 Following implementation of the above mitigation measures the significance of the effect can be also be assessed as **Negligible**.

[4] Impact on construction workers as a result of excavation into potentially contaminated soil/groundwater i.e. made ground, where present

12.84 At this stage intrusive ground investigation works have not been conducted and the chemical quality of soils and groundwater have not been established. However, the Phase 1 Geo-environmental Desk Study Report indicates that the Site is unlikely to be significantly impacted by contamination. The overall significance is assessed as **Minor adverse**.

12.85 Measures will be implemented during earthworks and construction to protect workers from any contamination identified. All construction workers and site visitors will adhere to the relevant health and safety measures to ensure that any exposure to potentially contaminated soils/groundwater is avoided or minimised as far as is practicable. This will be addressed in risk assessments and method statements included within the Construction Phase Health and Safety Plan (CPHSP), as part of the construction Design and Management Regulations (CDM) 2015.

12.86 Measures will include the use of personal protective equipment (PPE) such as gloves, dust masks and overalls, as appropriate, to reduce potential for exposure to harmful materials, safety briefings and tool box talks to raise awareness etc. Ground workers should not physically handle potentially contaminated materials on site. Although significant contamination is not anticipated across the Site, if required, a specialist contractor should be appointed to undertake any significant remediation works deemed necessary as part of the Proposed Development.

12.87 Through implementation of best practice and the use of appropriate PPE, it is considered that the significance of the effect can be assessed as **Negligible**.

[5] Impact on construction workers as a result of excavations into and treatment of unrecorded unstable mining features i.e. shafts and unrecorded shallow coal workings:

12.88 Construction works in and around mining features carries a risk as the features can be potentially unstable, particularly when disturbed. Extensive earthworks are anticipated across the site during enabling/ground treatment works and the presence of 3 recorded former mine shafts and areas of numerous recorded bell pits have been identified in discrete areas of the Site. The precise location of recorded and unrecorded mine entries should be established during intrusive ground investigation works, together with any other unrecorded mining features that arise during Site enabling and earthworks. The overall significance is assessed as **Moderate adverse**.

12.89 Large areas of the Site are located within a CA DHRA associated with historic shallow coal mine workings. Intrusive ground investigation works will be required to confirm the presence or otherwise of shallow coal mine workings. This will inform the requirement of drilling and grouting to stabilise workings. Earthworks and construction works will be carried out to agreed method statements and a watching brief for any other unrecorded mining features will be implemented throughout the works. Should any previously unrecorded features be encountered, these will be investigated and treated as necessary.

12.90 The overall significance of effect to can be assessed as **Negligible**.

[6] Impact on construction workers and site neighbours from the generation of dust from excavation and stockpiling of construction materials including made ground and natural soils

12.91 It is likely that the phasing of the works will require temporary stockpiling of natural soils and potentially made ground materials, which may potentially generate airborne dust through drying and loss of moisture of these materials. The overall significance is assessed as **Minor adverse**.

12.92 As far as reasonably practicable, the works will be programmed to minimise the volume of soil stockpiled at any one time. The following general mitigation measures will be implemented if necessary:

- Where practical, stockpiling areas for contaminated soils and demolition materials, if present, will be screened by bunds constructed from uncontaminated materials and secured by temporary protective fencing and hazard signage
- Monitoring of dust concentrations in ambient air will be undertaken around the earthworks areas and stockpile areas to act as a trigger for the implementation of control measures and provide a record. The monitoring data will be made available to the regulators as required
- Should particularly odorous or highly contaminated material be encountered, this material will either be removed directly off site, or will be stockpiled in a dedicated area and covered with clean material or sheeting to mitigate any potential harmful releases
- Routine boundary monitoring of total and respirable dusts at upwind and downwind boundary
- Stockpiles and haul roads will be dampened down during periods of prolonged dry weather to mitigate dust generation

12.93 By implementing the above control measures during the proposed works, it is considered that the significance of the effect can be assessed as **Negligible**.

Operational Phase

[7] Introduction of contamination into soil, surface and groundwater as a result of accidental spillages/leakage from vehicles (site users and delivery vehicles) during the operational phase:

12.94 Accidental spillages/leakages from vehicles using the Proposed Development could potentially be transmitted into soil and groundwater via infiltration and runoff. The overall significance is assessed as **Minor adverse**.

12.95 Infiltration will be limited by hardstanding cover across large areas of the northern and eastern parts of the site associated with the employment zone and hardstanding along the vehicle access points and estate roads of the proposed residential development areas. Therefore, infiltration will be limited to the areas of soft landscaping and gardens, areas where vehicle access is unlikely.

12.96 Rainwater runoff over the Proposed Development could potentially carry any substances which are leaked or spilt from vehicles using the Site. It is envisaged that as part of the drainage system, all surface water runoff shall be intercepted via drains and stored temporarily in order to release to the watercourse at a slower rate. To mitigate the risk of potentially harmful substances being carried within the runoff, fuel interceptors should be incorporated within the drainage design to remove any hazardous substances which might be present. The interceptors should be subject to regular maintenance and inspections to ensure they are functioning correctly.

12.97 Following these mitigation measures, there is an unlikely probability of occurrence. Therefore, the overall significance of the effect can be assessed as **Negligible**.

[8] Introduction of contamination into soil, surface and groundwater as a result of accidental spillages/leakage from the storage of raw materials, bulk fuels and liquids within the employment zone during the operational phase:

12.98 There is the potential for accidental release of stored fuels and chemicals directly affecting localised areas of soils and groundwater via infiltration and/or potentially entering surface watercourses from direct discharge via drainage infrastructure or surface runoff. The overall significance is assessed as **Minor to Major adverse**.

12.99 These pollution incidents may occur due to incorrect handling, storage, use or transport of materials such as fuels, oils and chemicals and is considered most applicable in the northern and eastern areas of the Site where the employment zone is proposed.

12.100 The use of an appropriate environmental management system for the operation of facilities handling such materials will be required under the CDM (2015) regulations, including design of suitable containment measures and pollution control measures to mitigate environmental risks arising from accidental release of potentially contaminating substances. Once mitigation measures are implemented, the significance of the effect is considered to be **Negligible**.

[9] Degradation of building materials and buried services over time e.g. as a result of contact with sulphate within soils and low pH:

12.101 Formal intrusive ground investigations for the Proposed Development will be undertaken at detailed design stage. As part of the ground investigations, appropriate chemical laboratory analysis will be required to establish the design criteria for buried concrete structures and other buried utilities in accordance with industry guidance. The overall significance is assessed as **Minor adverse**.

12.102 In order to mitigate against any adverse effects to buried utilities, services shall be required to be composed of suitably resistant or barrier material. The exact specification for buried utilities will be established at detailed design stage, but it is considered likely that standard materials will be suitable across the majority of the Site due to the predominance of natural soils. However, this will be subject to confirmatory chemical laboratory testing.

12.103 By using appropriate materials for the construction of the Proposed Development and associated infrastructure, the significance of the effect can be considered to be **Negligible**.

[10] Impacts on buildings and substructures as a result of unstable ground (mining features, shafts, shallow workings etc.):

12.104 Unstable ground, as a consequence of mining legacies at the Site are confirmed as present. Such features include shallow mine workings and mine shafts, which could adversely impact development. The overall significance is assessed as **Moderate adverse**.

12.105 Previously unstable ground will be directly stabilised during the construction works, as required based on the findings of the intrusive ground investigation works. This will confirm the presence of shallow coal workings beneath the Site and what mitigation measures are required, e.g. treatment by drilling and grouting to allow safe redevelopment to take place. In addition, the location of the 3 shafts identified should be established, together with any further unrecorded mine entries, and the requirements for treatment and capping established.

12.106 It is anticipated that ground stability issues can be mitigated with appropriate design during the excavation and construction works.

12.107 New development over or in close proximity to treated mine shafts should be avoided as part of appropriate mitigation during construction. Preliminary layout and land use zonation for the Proposed Development indicate that the 3 recorded former mine shafts are coincident with the

employment area within the northeastern part of the Site. Any potential zones of influence or no build zones from these recorded, or unrecorded, mine entries are not anticipated as being extensive and, as such, minor changes in layout should be able to accommodate appropriate mitigation where such features potentially affect development proposals.

12.108 Once mitigation measures are implemented the magnitude of the effect is considered to be negligible. Therefore, the overall significance of the effects has been assessed as **Negligible**.

[11] Impact on future Site occupiers as a result of hazardous ground gas:

12.109 There is a risk of hazardous ground gas generation associated with historic mine workings, mine entries and any areas of deep made ground deposits. The overall significance is assessed as **Major adverse**.

12.110 Intrusive ground investigation work will be undertaken to inform the design of the Proposed Development. Ground investigation works will require incorporation of an appropriately designed ground gas monitoring programme and subsequent ground gas risk assessment to classify the risk potential and confirm the requirement for gas protection measures.

12.111 Assignment of the gas risk classification at the site will be in accordance with industry guidance, on completion of the gas monitoring programme. It is recommended that any final gas risk classification for the Site is reserved pending discussions with KMDC and approval of any recommended gas protection measures, if required, has been granted. This would inform detailed design.

12.112 The Site is located within a Radon Affected Area and all new buildings will require the installation of basic radon protection measures to mitigate against the associated risk.

12.113 The design and installation of any required gas protection measures (fully validated by an independent verification engineer) will mitigate any potential impact posed by hazardous ground gas to the Proposed Development. Therefore, the overall significance of the effect can be assessed as **Negligible**.

Cumulative Effects

12.114 Cumulative effects have been considered for other developments within the vicinity of the Site.

12.115 A residential development located south of Heybeck Lane and comprising some 180 dwellings is proposed immediately adjacent and to the north of the Site. A planning application for the development has yet to be submitted. The area of the proposed adjacent development is agricultural land. Coal mining legacies are associated with the site of this proposal.

12.116 A further residential development comprising 252 dwellings with open space, landscaping and infrastructure is proposed immediately southeast of the Site on the opposite side of Chidswell Lane. A planning application has been submitted. Supporting information comprises an intrusive Phase II Geo-environmental Report and an accompanying Minerals Statement.

12.117 The supporting information, included as publicly available information as part of the planning application submissions, records the presence of site-wide contamination by metals (arsenic) and polycyclic aromatic hydrocarbons (benzo-a-pyrene) within the surface topsoil together with localised asbestos presence. However, this is regarded as site specific. The presence of coal mining legacies across the proposal are inconclusive.

12.118 Given the above information relating to the proposed neighbouring residential developments, any adverse cumulative effects, either during the construction or operational phase of the Proposed Development, are regarded as unlikely with regard to contamination and unstable ground.

12.119 The implementation of appropriate mitigation measures as part of the neighbouring proposals would result in a reduction of the magnitude of any residual cumulative effect to negligible. Therefore, the overall significance of the effect of these cumulative impacts has been assessed as **Negligible**.

Residual Effects

12.120 There are expected to be no significant adverse residual effects as a result of the Proposed Development in respect of the ground conditions assuming that mitigation measures identified in the previous section are implemented. This is summarised in Table 12.10 below.

Table 12.10 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
<i>Construction Phase</i>			
The Moderate adverse effect from the loss of soil / natural strata and minerals	Whole Site	Reuse of suitable materials (e.g. topsoil / subsoil) on site. (para 1.72)	Negligible effect on soil / natural strata and minerals
Minor adverse effect of the introduction of additional contaminants into soil, surface and groundwater	Whole site	Preparation of a CEMP, adopt best practise for the handling of hazardous materials, use of bunded storage areas, restrict the maintenance of vehicles on site. (Para 1.81)	Negligible effect on soil, surface and groundwater
Moderate adverse effect of the introduction of silt and debris into surface watercourses from site runoff	Controlled Waters	Preparation of a CEMP, development of a construction phase plan, adopt good stockpile control and minimise runoff as far as is practicable. (Para 1.85)	Negligible effect on surface watercourses
Minor adverse effect from excavation into potentially contaminated soil/groundwater	Construction workers	Safe systems of works (para 1.89) and PPE (para 1.90)	Negligible effect on workers
Moderate adverse on construction workers as a result of excavations into and treatment of unrecorded unstable mining features	Construction workers	Site investigation and remedial treatment of any unstable ground. (Para 1.94)	Negligible effect on workers
Minor adverse effect on construction workers and site neighbours from the generation of dust during earthworks	Construction workers	Screening, sheeting, monitoring and damping down. (Para 1.98)	Negligible effect on workers
<i>Operational Phase</i>			
Minor adverse effect of the introduction of additional contaminants into soil, surface and groundwater as a result of accidental spillages/leakage from vehicles	Whole site	Adopt best practise for the handling of hazardous materials, use of bunded storage areas, restrict the maintenance of vehicles on site. Fuel	Negligible effect on soil, surface and groundwater

interceptors. (Para 1.102 and 1.103)			
Minor to Major adverse effect of contamination into soil, surface and groundwater as a result of accidental spillages/leakage from the storage of raw materials, bulk fuels and liquids within the employment zone	Whole site	Environmental Management Systems. (Para 1.108)	Negligible effect on soil, surface and groundwater
Minor adverse effect of degradation of building materials and buried services over time as a result of contact with sulphate within soils and low pH	Buried concrete and water supply pipe	Specification of appropriate materials. (Para 1.10 and 1.11)	Negligible effect on buried concrete and services
Moderate adverse effect on buildings and substructures as a result of unstable ground (mining features, shafts, shallow workings etc	Building structures	Site investigation and remedial treatment of any unstable ground. (Para 1.115, 1.116 and 1.117)	Negligible effect on building structures
Major adverse effect on future site occupiers as a result of hazardous ground gas	Site occupiers	Site investigation, monitoring and gas protection systems. (Para 1.121, 1.22, 1.123 and 1.124)	Negligible effect on site occupiers

Summary

12.121 This assessment addresses the likely significant effects of the Proposed Development with respect to contamination of soils and groundwater together with mining legacy features known to be present across the site.

12.122 As no previous intrusive ground investigation has been undertaken, baseline data are drawn from available published historical, environmental and geological information pertinent to the Site.

12.123 Using a scale of significance criteria, the magnitude of any effects with respect to the sensitivity of the receptor can be fairly assessed. The type of effect can be either positive (beneficial), negative (adverse) or negligible, assessed at both construction and operational phases.

12.124 During both the construction and operation of the Proposed Development, the significance of any effect, pre-mitigation, is assessed as being **Minor to Major adverse**.

12.125 Appropriate mitigation measures adopted during construction should include reuse of site-won natural soils, implementation of a Construction Environmental Management Plan and remediation of any identified contamination and stabilisation of unstable ground, as a consequence of former mining activities.

12.126 Consequently, any residual effects during construction would be reduced to **Negligible**.

12.127 The implementation of robust environmental management systems, stabilisation of mining related unstable ground, due consideration of the layout of the Proposed Development with respect to former mine entries and monitoring for hazardous ground gases negates any residual impacts.

REFERENCES

British Geological Survey (BGS) Mapping Sheet SE22SE 1:10K Solid & Drift Edition
BGS Mapping Sheet 78 Wakefield 1:50K Solid & Drift Edition

BGS Technical Report WA/96/17 'Geology of the Ossett Area' Lake RD 1996
British Standards Institution (BSI) BS10175:2011+A1:2013 'Investigation of Potentially Contaminated Sites – Code of Practice'
Coal Authority (CA) Consultants Coal Mining Report Ref. 51001875762001 12th July 2018
CA Shaft Plan and Data Sheets Ref. 51001875762001 12th July 2018
CA Abandonment Plan 'Top Haigh Moor Coal Seam Underground Plan' Ref. 10091
CA Abandonment Plan 'Tufty Farm Extension Opencast Plan' Ref. NE771
Department for Environment Food and Rural Affairs (DEFRA) Environmental Protection Act:1990 Part 2A Contaminated Land
Statutory Guidance Revision April 2012
Environment Agency (EA) CLR11 2004 'Model Procedures for the Management of Land Contamination'
European Union (EU) Water Framework Directive 'Water Environment (Water Framework Directive) England and Wales'
Regulations 2017
EU Groundwater Directive 2006/118/EC
Geological Survey of Great Britain (GS) Mapping Sheet 232SE Batley 1:10,560 County Series 2nd Edition Solid & Drift
GS Memoir 'Geology of the Country Around Wakefield' Sheet 78 1940
GS Memoir 'The Geology of the Yorkshire Coalfield' Green AH 1878
Kirklees Council Local Plan Adopted 27th February 2019
Ministry of Housing, Communities and Local Government National Planning Policy Framework (NPPF) 2019
Patrick Parsons Ltd (PPL) 'Phase 1 Geoenvironmental Desk Study Report - Heybeck Lane and Land to the East of Leeds Road,
Chidswell' Ref. H18017 Rev. 3 December 2019
PPL 'Coal Mining Risk Assessment (CMRA) - Land East of Leeds Road, Chidswell, Dewsbury' Ref. H18119B CMRA Rev. 2
December 2019
RJB Mining (UK) Ltd 'Windsor Proposed Opencast Coal Site – Environmental Statement and Supporting Information' July 1997
Wilcockson WH 3rd Edition 1950 'Sections of Strata of the Coal Measures of Yorkshire'

13 Transport

Introduction

- 13.1 This Chapter of the Environmental Statement (ES) assesses the likely significant effects of the Proposed Development with respect to Transport and Highways. This chapter describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted. This chapter has been prepared by Pell Frischmann on behalf of C.C. Projects (the 'Applicant').
- 13.2 This Chapter is accompanied by Appendix 13.1: Transport Assessment (TA) and Appendix 13.2: Framework Travel Plan (FTP), which provide additional detail beyond the scope of this ES.

Legislative and Policy Context

National Planning Policy

The National Planning Policy Framework (NPPF) (2019)

- 13.3 The Government's National Planning Policy Framework (NPPF) sets out the government's planning policies for England and how these should be applied. A revised NPPF was adopted in July 2018 and last updated in June 2019.
- 13.4 It sets a policy framework for local councils to use when preparing their own Local Plans. This approach allows the planning system to be customised to reflect the needs and priorities of individual communities.
- 13.5 At the heart of the NPPF is a presumption in favour of sustainable development, and the NPPF notes that *'the purpose of the planning system is to contribute to the achievement of sustainable development'*. At a very high level, the objective of sustainable development can be summarised as *'meeting the needs of the present without compromising the ability of future generations to meet their own needs'*.
- 13.6 The NPPF defines the delivery of sustainable development through three roles:
- *an economic objective;*
 - *a social objective; and*
 - *an environmental objective.*
- 13.7 Chapter 9 of the NPPF relates to the promotion of sustainable development. Paragraph 102 states that:
- *'Transport issues should be considered from the earliest stages of plan-making and development proposals, so that:*
 - *the potential impacts of development on transport networks can be addressed;*
 - *opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;*

- *opportunities to promote walking, cycling and public transport use are identified and pursued;*
- *the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and*
- *patterns of movement, streets, parking and other transport considerations are integral to the design of schemes, and contribute to making high quality places.'*

13.8 Paragraph 108 states that:

- *'In assessing Sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:*
 - *appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*
 - *safe and suitable access to the Site can be achieved for all users; and*
 - *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.'*

13.9 Paragraph 109 notes that *'development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe'.*

13.10 Within this context, paragraph 110 notes that *'applications for development should:*

- *give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*
- *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
- *create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
- *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.'*

Local Planning Policy

Kirklees Economic Strategy

13.11 The Kirklees Economic Strategy was adopted by Kirklees Council (KC) in March 2019 and spans from 2019-2025.

13.12 According to Chapter 1: Our Vision, *"the strategy focuses on creating sustained economic growth and providing good employment for and with communities and businesses. It aligns to the Kirklees Local Plan and is supported by other strategies that have a fundamental impact on*

our economy... This strategy also responds to the UK Industrial Strategy and focuses on the Kirklees contribution to raising the nation's productivity."

13.13 Transport falls under Priority 4: Advanced Connectivity and Infrastructure. The long-term outcome is as follows:

"To deliver an inclusive and productive economy we need to ensure all of Kirklees has the highest standards of connectivity and infrastructure. This includes not just road investment but public transport, active travel and modal shift to support the quality of our places, health, inclusion and air quality, safe, joined up cycling/walking routes and facilities and digital connectivity."

Kirklees Local Plan (2019)

13.14 The KC Local Plan is the statutory development plan for the land under KC jurisdiction. The Local Plan was the subject of an Examination in Public (EIP) by a Government-appointed Inspector in February 2018 and was adopted in February 2019. The timespan of the Plan is 2013-2031. Its purpose is to set out the policies necessary for sustainable development in the district.

13.15 The Site for the Proposed Development is allocated within the KC Local Plan, in the Batley and Spen sub-area, reference MXS7 (Land east of, 932-1110 Leeds Road, Shaw Cross/Woodkirk, Dewsbury). Allocation MXS7 is split into two development parcels: "Land at Heybeck Lane" and "Land to the East of Leeds Road". Both parts of Allocation MXS7 are owned by the Applicant, however are being brought forward separately in two parallel outline planning applications.

13.16 Land at Heybeck Lane (referred to in the Transport Assessment as 'Site A'; Appendix 13.1) is not subject to the ES process and is noted in this chapter as a committed development in the context of background growth. Land to the East of Leeds Road (referred to in the Transport Assessment as 'Site B'; Appendix 13.1) is the subject of this ES assessment and is herein referred to as 'the Site'.

13.17 The Local Plan's Vision (4.2) states that:

"Kirklees will be ideally placed to encourage inward investment and stimulate economic growth. This will be achieved through the provision of new prime employment land, Sites of strategic importance for employment with a focus on manufacturing and engineering including Whitehall Road, Cleckheaton and Chidswell and safeguarded employment land which, as a whole, provide the opportunities to grow businesses, improve economic resilience and increase the district's ability to compete with other areas, economic benefits of housing delivery and the potential to reduce out-commuting."

13.18 Regarding transport, Section 6.1 states that in order to improve the vision, objectives and strategy, the Local Plan will "improve transport links and sustainable travel" through:

- "Support a pattern of development which helps facilitate the use of sustainable modes of transport by focusing most new development in the main urban areas where there is easier access to the core road and bus network
- Proper consideration of infrastructure opportunities and constraints relating to land allocations particularly where crucial infrastructure is needed to deliver growth.
- Focus on mixed use sites in the plan where land use mix can be more flexible, viable and allow for more sustainable development and place shaping, particularly in or on the edge of town centre locations."

13.19 Additionally, Section 6.1 states that the Local Plan will "tackle inequality and give all residents the opportunity of a healthy lifestyle:

- "Avoiding allocating land for development in the worst areas of air quality in Huddersfield, Dewsbury, Batley and Spen

- *Allocating/protecting key employment opportunities in areas of high unemployment and deprivation in Huddersfield, Dewsbury, Mirfield, Batley, Birstall, Cleckheaton*
- *Setting out transport proposals which address air quality issues*
- *Providing land for new homes in all parts of the district."*

13.20 In Chapter 10: Transport, Policy LP20: Sustainable travel states:

"The council will support development proposals that can be served by alternative modes of transport such as public transport, cycling and walking and in the case of new residential development is located close to local facilities or incorporates opportunities for day to day activities on site and will accept that variations in opportunity for this will vary between larger and smaller settlements in the area.

The council will support demand management measures which discourage single occupancy car travel within new development and encourage the use of low emission vehicles to improve areas with low levels of air quality. Proposals should include measures to encourage the use of sustainable travel options, including public transport, the promotion of personal journey planning, walking, cycling, car sharing, electronic communication and home working."

13.21 Further to this, Policy LP21: Highways and access states:

"Proposals shall demonstrate that they can accommodate sustainable modes of transport and be accessed effectively and safely by all users... Proposals shall demonstrate adequate information and mitigation measures to avoid a detrimental impact on highway safety and the local highway network. Proposals shall also consider any impacts on the Strategic Road Network."

13.22 Policy LP22: Parking, Section 10.89 states that:

"Car ownership levels are increasing despite car usage declining. There is need for new development to accommodate sufficient parking facilities. NPPF states when considering parking provision, a flexible approach is required that considers the accessibility of the development, the type, mix and use of development, the availability of public transport, car ownership levels and a need to reduce the use of high-emission vehicles."

13.23 Policy LP23: Core walking and cycling network, Section 10.101 states that:

"All proposals will be expected to have regard to the core walking and cycling network and demonstrate how their development will provide connecting links to the network where appropriate. On larger sites, developers will be expected to contribute to the enhancement of existing sections of the core network or contribute to the establishment of new sections of the route where the site would benefit from improved links to existing settlements and transport hubs. These can be delivered through scheme design, planning conditions and the use of planning obligations."

13.24 As mentioned above, Kirklees Local Plan's Infrastructure Delivery Plan Addendum (November 2016) expands on the A653 Leeds Road improvement plans. It states that Policy TS5, the A653 Leeds Road Corridor, is in the Mirfield to Dewsbury to Leeds and North Kirklees Growth Zone, and that the junction improvements are "essential".

13.25 It goes on to state that the effect for Kirklees will be to "reduce bi-directional journey times for all modes on the A653 and A644 corridors and Improve access to the M1 and M62, allowing businesses in North Kirklees to become better connected to labour markets across West Yorkshire." The improvements will thus:

"'Kick-start' the transformative change of the urban centre of Dewsbury by encouraging investment and inward migration into the local area. Enhancing [sic] connectivity for walking and cycling between Dewsbury and its neighbourhoods and the associated uptake in active

travel will improve the general health of the residents in the area. An improvement to public transport provision along the key route network will reduce the impact on air quality associated with overuse of the private car. The scheme will provide for future housing and employment growth in the local area and also maximise the benefits of the Bradford Road corridor as a well-developed and popular employment location and entertainment destination."

13.26 Most relevant to the Proposed Development are the comments:

"There will be improvements along the A653 corridor between Dewsbury and Leeds, in particular at the junction of the A653 and B6128 (Shaw Cross) to facilitate improvements to bus and car journey times between Dewsbury and Leeds, proving more efficient journeys to Leeds city centre, White Rose, Aire Valley and the M62 corridor and to accommodate a major mixed-use allocation in Chidswell."

Assessment Methodology and Significance Criteria

13.27 The following section outlines the methodologies applied to identify and assess the range of potential transport and access effects likely to result from the Proposed Development.

13.28 The Kirklees Local Plan was the subject of an Examination in Public (EIP) by a Government-appointed Inspector in February 2018 who considered the evidence presented by KC to support the Local Plan. To support the allocation of the Site in this process, an Interim Transport Assessment (ITA) was produced in August 2016, together with other supplementary information, to inform KC Highways officers and the Government-appointed Inspector of the potential transport and highways effects of a strategic masterplan development at the Site. Data produced at that time also fed into the wider highway modelling activities undertaken by KC to support the Local Plan.

13.29 Processes and methodologies herein were initially informed by that 2016 Interim Transport Assessment, but have since developed through a scoping process which was undertaken through 2018 and 2019 with KC, Leeds City Council (LCC), Wakefield Council (WC), and Highways England (HE) to establish the technical basis for the Transport Assessment (TA) (and Framework Travel Plan [FTP]) to support this planning application. This Chapter has therefore been produced in accordance with the formal Environmental Impact Assessment (EIA) screening Responses issued by KC which include the relevant scoping opinions of those other stakeholders listed above. This scoping process also included regular meetings with KC and further meetings with HE and others.

13.30 The assessment presented takes into account the legislative and policy context detailed above, both directly and through the scoping process described.

Assessment Methodology

Baseline characterisation

13.31 To inform the baseline and modelling aspects of this TA, a specialist traffic survey company was commissioned to:

- Carry out Manual Classified Turning Counts (MCTCs) on 11 key junctions in the area surrounding the Site;
- Assess queue length, saturation flow and signal timings, as appropriate, at the same junctions;
- Install Automated Traffic Counters (ATCs) at 12 locations including future locations of Site accesses, Dewsbury Town Centre Air Quality Management Area (AQMA), and key points across the study area.

- The scope of these surveys was agreed with KC Highways and HE officers (in advance) through the scoping process.

Method of Assessment

13.32 This section outlines the methodologies applied in undertaking the assessment of the transport and access effects associated with the Proposed Development.

13.33 The methodology adopted in assessing the likely traffic and transport effects is based upon the Institute of Environmental Assessment (IEA) document 'Guidance Notes No. 1: Guidelines for the Environmental Assessment of Road Traffic', 1993, and is in accordance with the Government's planning policies for England as set out in the NPPF.

13.34 The number of trips associated with the Proposed Development has been calculated using the industry standard TRICS trip rate database at the operational stage.

Assessment Scenarios

13.35 Assessment of the effect of the Proposed Development is made by comparison of pairs of future scenarios, one in which the Proposed Development is delivered (in part or in full), and the other in which the Proposed Development is assumed not to occur. These are described herein as the "With Development" and "Without Development" scenarios respectively. The difference between the scenarios allows the identification of the net effect of the Proposed Development to be identified in the context of the general and wider changes expected in the area over the period of assessment.

13.36 Additionally, assessment has been undertaken to assess the temporary effects of the Proposed Development during the demolition and construction process. This applies through the period of delivery, i.e. through to 2030. Given the outline nature of the application, the consideration of demolition and construction is necessarily high level.

13.37 Effects have been determined for the following assessment scenarios:

- **2019 Base:** Observed traffic flows based on 2019 traffic surveys;
- **2024 Without Development⁵³:** Based on '2019 Base' traffic data with 2019-2024 growth factors (derived from the 2019 and 2024 interpolated KC SATURN 'Do Minimum' scenarios) therefore including a proportion of committed Local Plan developments as incorporated in the strategic SATURN model (e.g. Barratt David Wilson Homes [BDWH] Site on Owl Lane and LCC's committed developments). This scenario also includes the manual addition of the part of the 'Land at Heybeck Lane' development expected to be delivered by 2024 (see below and Chapter 5: Construction Programme and Methodology);
- **2024 With Development⁵⁴:** '2024 Without Development' plus phased Proposed Development on the Site (see below and Chapter 5: Construction Programme and Methodology);
- **2030 Without Development⁵⁵:** Based on '2019 Base' traffic data with 2019-2030 growth factors (derived from the 2019 and 2030 interpolated KC SATURN Do Minimum scenarios) therefore including committed Local Plan developments as incorporated in the strategic SATURN model (e.g. BDWH Site and, in addition, LCC committed developments). This scenario also includes the manual addition of the complete and operational development delivered on 'Land at Heybeck Lane';

⁵³ Referred to as "2024 Do Something Site A" in the Transport Assessment; Appendix 13.1

⁵⁴ Referred to as "2024 Do Something Site A+B" in the Transport Assessment; Appendix 13.1

⁵⁵ Referred to as "2030 Do Something Site A" in the Transport Assessment; Appendix 13.1

- **2030 With Development⁵⁶:** '2030 Without Development' plus full Proposed Development on the Site.

13.38 Traffic effects of the Proposed Development are assessed for two future assessment years; 2024 and 2030. The former (2024) being an interim scenario in which some phases of the Proposed Development have been delivered. It is considered that 1 commercial unit totalling 9,780sqm is likely to have been delivered by this time. To ensure a robust assessment, a 'worst case' B1(a) Office use trip rate has been assumed for this scenario. The latter assessment year (2030) is the future year in which all potential phases of the Proposed Development are anticipated to be complete and operational (i.e. 1354 residential units, 35ha of employment plus a new primary school).

13.39 It is noted that the scenarios presented above are consistent with those assessed in the TA which accompanies this chapter. Each scenario consists of a Weekday AM peak and Weekday PM peak.

Local Highway Network and Existing Traffic Conditions

13.40 In addition to those flow determinations described above and used in this Chapter, these figures have been factored to create estimated 24-hour Annual Average Daily Traffic counts (AADTs) for each link for each scenario. These flows are used elsewhere in this ES for the determination of air quality (Chapter 10: Air Quality) and noise effects (Chapter 9: Noise and Vibration). Effects on the road network are quantified in this Chapter based on junction effects (see below) as in an urban area, these are the determinant of the quality of network operations.

13.41 AADT flows are determined through the 'AM Peak Factoring Method' as follows:

- Flows across the surveyed period for each ATC are averaged over a 7 day period inclusive of 2 weekend days.
- The AM peak hour for each ATC is determined as a proportion of the daily average (generally between 6% and 10%)
- A weighted average of those AM peak hour proportions are taken for the ATCs within the defined study area.
- This results in an area AM peak factor (in this case, 0.0733).
- AM peak MCTC turning flow counts are divided by this factor to derive AADT turning flows. E.g. a 1000 passenger car unit (pcu⁵⁷) AM peak flow becomes a 13,652 vehicle AADT; i.e. $1,000/0.0733$
- Link AADTs are determined by the sum of all inflows and outflows at the end of the link (averaged over the two if it is a link for which there is a surveyed junction at either end)

13.42 18h Annual Average Weekday Traffic (AAWT) flows are determined by the same methodology, save that the AM peak factor is determined against the average of the weekday flows in the 0600-0000 time band (here, 0.0862).

13.43 This methodology has been applied across the study area network as a whole in order to maintain internal consistency. The three links within the Dewsbury AQMA are excepted as no MCTC data was available for these junctions. This data is determined directly from the relevant ATCs.

13.44 In addition to AADT and AAWT data, data was also requested by Delta Simons for HGV traffic proportions and for average link speeds. This data was collated as follows:

⁵⁶ Referred to as "2030 Do Something Site A+B" in the Transport Assessment; Appendix 13.1

⁵⁷ Passenger car units (pcu) provide a mechanism for converting a traffic flow comprised of mixed vehicle types (e.g. cars, buses and bicycles) to a common baseline measure. As implied by the term, a standard passenger car is defined as 1.0pcu with other vehicles being assigned a factor relative to that. For example, bicycles are commonly valued at 0.2pcu and buses at 2.0pcu.

13.45 HGV data, in descending order of preference:

- ATC surveyed data: ATC data is classified by vehicle lengths/axles. Those classes of vehicles three axles or greater, excluding short vehicles towing (e.g. car plus caravan) are defined as HGV for this purpose and are aggregated over the period concerned (7 day x 24h for AADT, and 5 weekdays x 18h for AAWT) as a proportion of the overall number of motor vehicles in that period.
- Highways England data for 2018: On the Highways England network, induction loops buried in the carriageway as part of the Motorway Incident Detection and Signalling system (MIDAS) are available through the WebTRIS interface and can provide a proportion of vehicles over 6.6m in length from 2018. This is assumed to represent the proportion of heavy vehicles as a component of the overall flow.
- MCTC peak period (0700-1000 and 1600-1900) data is available broken down by (visually-identified) vehicle class for surveyed neutral day. The proportion of medium and heavy goods vehicle flow through a given junction arm is taken as a proportion of the overall motor vehicle flow in that period. Note that as this covers only surveyed peak hours, it represents the lowest confidence of the data available, however provides a reasonable (and best available) approximation for general HGV traffic proportions.

13.46 Mean speed data, in descending order of preference:

- ATC surveyed data: ATC devices aggregate vehicle speeds in 5mph bands. This raw information is aggregated and averaged over the period concerned for those links with ATC data available.
- Posted Speed Limits (PSL): For those links where surveyed speed data is unavailable, the posted speed limit (i.e. the legal speed limit in force on street) for that link is assumed to be representative of vehicle speeds.
- Design Speed: For those links not yet constructed, design speeds are used as defined by the KC Highways Design Guide SPD appropriate to that category of street type

13.47 For future scenarios, the following assumptions were made:

- AM peak factors remain the same in the future. Future flows are determined from future AM peak scenario predictions.
- HGV proportions on the network are assumed to be unchanged in the future.
- Speeds are assumed to be unchanged in the future.

13.48 Given that the Proposed Development (in particular, the proposed residential and employment mix) is similar to existing land use patterns in the surrounding area, and that the majority of future flows are background traffic unrelated to the Proposed Development at hand, these are considered reasonable assumptions.

Pedestrian Movement and Capacity

13.49 Pedestrian movement and capacity has been assessed by site observations and a desktop study. The potential number of additional pedestrian movements has been calculated using the industry standard TRICS trip rate and census mode share, and compared against the proposed pedestrian facilities incorporated in the Proposed Development.

Pedestrian Severance, Delay, Fear and Intimidation, Amenity

13.50 Pedestrian severance, delay, fear and intimidation, and amenity, has been assessed by considering the baseline traffic flow against the potential traffic flow associated with the Proposed Development.

Cycling Facilities

13.51 The existing cycling facilities have been determined through site observations and a desktop study. The potential number of additional cycling trips has been calculated using the TRICS trip rate and census mode share.

Public Transport

13.52 The potential effect of the Proposed Development on public transport services has been assessed by calculating the likely additional number of passengers for both the AM peak hour and the PM peak hour.

Junction Capacity and Driver Delay

13.53 The scope of assessment has been agreed with KC. Junction assessments were undertaken in LINSIG and Junctions 9 (ARCADY & PICADY) to determine junction capacity at the junctions as set out above.

Road Traffic Collision and Safety Data

13.54 Data for road traffic accidents resulting in personal injury ('accident data') for the roads surrounding the Site has been obtained and assessed to establish any trends in causation factors. Professional judgement has been used to assess whether the Proposed Development will impact on road safety at the Site.

Significance Criteria

13.55 The assessment process identifies the potential effects pre-mitigation that may arise as a result of the Proposed Development. It subsequently identifies appropriate mitigation measures, and considers the changes (i.e. the residual effects) that are predicted to take place to the existing condition of the environment as a result of the Proposed Development.

13.56 Guidance provided by the Institute of Environmental Management and Assessment (IEMA) and the Department for Transport (DfT) has been consulted in order to identify significance criteria applicable to the assessment. For a number of residual effects, there are no established thresholds of significance, in which case interpretation and professional judgement is applied based on prior knowledge of the Site or quantitative data where available. The approach to each is described in the following sections.

13.57 In the assessment of transport effects, 'significance' often arises where the effect of a development causes infrastructure demand to approach or exceed the capacity available. With regard to roads this may relate to link capacity, or as is more common, junction capacity. More widely, effects on the capacity of public transport, pedestrian and cycle infrastructure may be of concern.

13.58 Transport effects may be either beneficial or adverse, apply in the short, medium or longer terms and be either temporary or permanent:

- **Beneficial effect** – One that is generally considered a positive aspect for users, receptors and/or the environment, such as a reduction in motor vehicle traffic or an improvement in the sustainability of transport undertaken. This can be subjective;
- **Adverse effect** – One that is generally considered a negative aspect for users, receptors and/or the environment, such as an increase in motor vehicle traffic or a degradation in the accessibility of a site. Again, this can be subjective;
- **Short term** – Of limited (i.e. temporary) duration that does not last a majority of the period of construction (i.e. less than 5 years);
- **Medium term** – Of limited (i.e. temporary) duration in the order of the majority (or all of) the period of construction (i.e. in the range of 5 to 10 years); or
- **Long term** – Of indefinite duration, i.e. extends beyond the period of construction and can be considered either practically or actually permanent (i.e. greater than 10 years).

13.59 The magnitude for assessing an effect will be characterised as either:

- **Major** – Total loss or major/substantial alteration to key elements/features of the without Development conditions such that due to the Proposed Development, character/composition/attributes will be fundamentally changed. These effects will usually be of measurable effect and may be expected to have a substantive impact on the capacity and/or capability of existing/proposed infrastructure;
- **Moderate** – Loss or alteration to one or more key elements/features of the without Development conditions such that due to the Proposed Development, character / composition / attributes will be materially changed. These effects will usually be of measurable effect and may be expected to have a noticeable impact on the capacity and/or capability of existing/proposed infrastructure;
- **Minor** – A minor shift away from without Development conditions. Change arising from the loss / alteration will be discernible / detectable but not material. The underlying character / composition/attributes of the without Development condition will be similar to the without Development circumstances / situation. These effects will usually be of measurable effect but would be expected to be substantially within the capacity and/or capability of existing/proposed infrastructure; or
- **Negligible** – Very little change from without Development conditions. Change barely distinguishable, of no consequence, or approximating to a 'no change' situation. Effects would be within the range of daily variation.

Sensitivity of Receptors

13.60 As well as the significance criteria, sensitive receptors are also key in determining the significance of the transport effects of a new development.

13.61 The sensitivity of a receptor is based on a number of factors such as the vulnerability or activity of the user. In line with the IEMA Guidelines, the sensitivity of receptors is outlined in Table 13.1.

Table 13.1: Sensitivity of Receptors

Sensitivity	Detail
High	The receptor / resource has little ability to absorb change without altering its present character, or is of international or national importance. Receptors of greatest sensitivity to traffic flows: • Schools, colleges and other educational institutions; • Retirement/care homes for the elderly or infirm; • Roads with no footway that may be used by pedestrians; or • Accident 'black spots'.
Moderate	The receptor / resource has moderate capacity to absorb change without altering its present character, or is of high importance Receptors with moderate sensitivity to traffic flows: • Hospitals, surgeries and clinics; • Parks and recreation areas; • Shopping area with roadside frontage; • Residential areas; or • Roads with narrow footway that may be used by pedestrians.
Low	The receptor / resource is tolerant of change without detriment to its character, is of low importance Receptors with some sensitivity to traffic flow: • Open spaces;

	• Tourist/visitor attractions; • Historic buildings; or • Churches and other places of worship.
Negligible	Receptors with no sensitivity to traffic flows and those sufficiently distant from affected roads and junctions.

13.62 A significance of environmental effect can also be determined by the interaction of magnitude and sensitivity, whereby the effects can be beneficial or adverse. The Effect Significance Matrix is set out in Table 13.2.

Table 13.2: Effect Significance Matrix with Significant Factors Identified

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse / Beneficial	Major – Moderate Adverse / Beneficial	Moderate – Minor Adverse / Beneficial
Moderate	Major – Moderate Adverse / Beneficial	Moderate – Minor Adverse / Beneficial	Minor Adverse / Beneficial
Minor	Moderate – Minor Adverse / Beneficial	Minor Adverse / Beneficial	Minor Adverse / Beneficial
Negligible	Negligible	Negligible	Negligible

13.63 The surrounding area to the Site is almost entirely residential, therefore the sensitivity of all relevant local receptors is considered moderate, unless otherwise stated.

Local Highway Network and Existing Traffic Conditions

13.64 Effects on the local highway network due to traffic changes are assessed in the context of the individual assessment items. The anticipated effects of any traffic changes are considered in detail through modelling (e.g. on delay at a junction due to queuing), rather than a pure assessment of numerical change as is IMEA Guidance.

Pedestrian Movement and Capacity

13.65 The significance of the increase in pedestrian flow has been assessed using professional judgement in conjunction with the TRICS assessment and mode share.

Pedestrian Severance, Delay, Fear and Imitation, Amenity

13.66 Significance thresholds for assessing severance are based on the range of indicators referred to the IEMA Guidelines where changes in traffic flow of 30%, 60% and 90% are regarded as producing "slight", "moderate" and substantial" changes in severance respectively.

13.67 Professional judgement has been applied to determine pedestrian delay.

13.68 The IEMA Guidelines have been referenced to assess any increase in fear and intimidation. They are set out in Table 13.3 below:

Table 13.3: IEMA Thresholds for Fear and Intimidation

Degree of Hazard	Average traffic flow over 18-hour day (vehicles/hour)	Total 18-hour HGV flow	Average over 18-hour day (miles/hr)
Extreme	1,800+	3,000+	20+
Great	1,200 – 1,800	2,000 – 3,000	15 – 20
Moderate	600 – 1,200	1,000 – 2,000	10 – 15

Cycling Facilities

13.69 The effect upon cycle facilities has been assessed using professional judgement.

Public Transport

13.70 Professional judgement has been used to assess the effect of the additional trips on the bus and rail networks.

Junction Capacity and Driver Delay

13.71 The assessment of the junction capacity of the local road network has been undertaken via quantitative modelling using specialist traffic junction modelling software. This software is either Junctions 9 or LinSig depending on whether the given junction is non-signalised or signalised, respectively.

13.72 Driver delay is directly related to the capacity of the road network and its significance is based on professional judgement.

Road Traffic Collision and Safety Data

13.73 Professional judgement has been used to assess the significance of the Proposed Development on road safety.

Limitations and Assumptions

13.74 To enable an assessment of the effect of the Proposed Development, a number of reasonable assumptions have been made on the basis of professional judgement and standard practice. These assumptions and other influences also lead to some identifiable limitations to the work undertaken. Together, the assumptions and limitations are:

- A baseline year at 2019 traffic levels is considered appropriate;
- Traffic surveys undertaken in March 2019 are considered representative of conditions on the local network, save that road works were underway on the M62 Junction 28 (J28) (Tingley Interchange) at the time of survey and these may not be fully representative.
- Existing Site use (as agricultural land) generates a negligible number of trips;
- Existing residential and commercial travel behaviours (collected through the 2011 census) for the Kirklees 014 MSOA (in which the majority of the Site falls) are a realistic indicator of current and future residential and commercial travel behaviours;
- In the absence of the Proposed Development, the current Site would be left 'as is' (i.e. there is a Without Development scenario);

- Background traffic growth is assumed to occur in line with Kirklees Council's SATURN Local Plan highway assignment model growth patterns. This includes all Local Plan sites as committed development and includes allowance for growth outside of Kirklees (for more details see TA at Appendix 13.1);
- Future background (Without Development) traffic forecasts are based on growth factors derived from Kirklees Council's SATURN strategic network modelling which carries increasing uncertainty at the local level and further into the future;
- Construction will be phased and delivered continuously from 2021 through to completion in 2030 (10 year period; see Chapter 5: Construction Programme and Methodology);
- Traffic external to the Site will not divert through the Site in the future, unless it is related to the Site itself;
- Potential strategic changes in traffic assignment due to the addition of Proposed Development traffic are not considered;
- Future trip generation behaviours (residential and otherwise) are captured by assessment of sites of comparable accessibility, use and sizes (i.e. industry-standard TRICS trip generation rates). Full details of this are included in the TA at Appendix 13.1;
- All trips generated by the proposed local centre, inclusive of the two-form entry school, are internal to the Site (or are 'hyper-local' and undertaken on foot);
- All trips generated by the residential and commercial uses of the Site are assumed to be external to the Proposed Development;
- The future residential development is assumed to include 10% of units in affordable ownership, with commensurate trip generation rates versus rates for private ownership which are generally higher;
- All residential units are assumed to be of C3 'dwellinghouse' land use, although some may ultimately be delivered as C2 'residential institutions'. As C3 uses have a higher trip generation rate, this ensures a robust and 'worst-case' assessment is undertaken.
- The future commercial development is assumed to have a land use split of: 15% B1(a) Office, 10% B1(c) Light Industrial, 25% B2 General Industrial, and 50% B8 Warehousing use, with trip generation rates commensurate with such use classes; and
- Future trip rates and patterns generated by the commercial development are likely to vary widely based on eventual occupiers (although the transport assessment has tested a robust 'worst case', i.e. the above land use split, in terms of traffic generation).

Baseline Conditions

13.75 As noted above, the following considers those items which have the potential to be impacted by the Proposed Development. For full details of the baseline transport conditions relating to the Site, please see the Transport Assessment included at Appendix 13.1.

Local Highway Network and Existing Traffic Flows

13.76 The A653 Leeds Road is a dual carriageway with two lanes in each direction providing access between Leeds and the M62 Junction 28 (Tingley Interchange) to the north and the town of Dewsbury to the south. Within the vicinity of the Site, it is a local 'A'-road owned and managed by KC as the Local Highway Authority. The Site is fronted by residential properties and also has a number of small farm accesses, including access to Lees House Farm which is adjacent to the Site.

- 13.77 To the south of the Site, Leeds Road becomes a single carriageway road with a single lane of traffic in each direction. It continues to be fronted by residential properties, with various local shops and facilities between the Site and Dewsbury town centre. As Leeds Road enters Dewsbury town centre, it meets the Dewsbury Ring Road which is a dual carriageway with limited active frontage.
- 13.78 The B6128 Owl Lane is a single carriageway road with a single lane of traffic in each direction. It connects the A653 Leeds Road with the A638 Wakefield Road. The junction of Leeds Road and Owl Lane is a signalised crossroads.
- 13.79 The West Yorkshire Combined Authority (WYCA) *West Yorkshire Transport Strategy 2040 (2017)* as well as the *KC Local Plan (LP; 2019)* identify strategic transport corridors. These corridors, which include road and rail routes, connect Leeds to the north with Bradford, Wakefield, Halifax and the main towns within Kirklees District, including Dewsbury and Huddersfield, with the Highways England (HE) Strategic Road Network (SRN).
- 13.80 The Site is situated within the Leeds – North Kirklees – Huddersfield – Manchester transport corridor, which is identified as the main strategic corridor in Kirklees District as it links the major towns with the adjoining regional centres. This corridor comprises several transport routes within Kirklees including strategic roads and the TransPennine Railway. The proposals for development in the KC LP have as far as possible been linked with this main corridor, both to take advantage of the highest quality transport links in the District and to ensure new developments are well connected and sustainable. The Site is also situated within the West Yorkshire Combined Authority (WYCA) 'Cross-Pennine' transport corridor which will be the subject of various road improvements.
- 13.81 The Site is therefore considered to be very well connected to the local, regional and strategic road networks.
- 13.82 Existing traffic flows are based upon traffic surveys undertaken at a number of points during 2019. These are presented in the tables below.

Table 13.4: 2019 AADT Link Flows

Link	Link Description	2019 AADT	2019 AADT HGV Propn. (%)	2019 AADT Mean speed (mph)	2019 18h AAWT	2019 18h AAWT HGV Propn. (%)	2019 18h AAWT Mean speed (mph)
L01	A653 Dewsbury Road (Hesketh La to Syke Rd)	28953	4.43%	40.0	24613	5.27%	40.0
L02	Rein Rd	12538	2.20%	20.0	10659	2.20%	20.0
L03	Syke Rd	8478	3.25%	30.0	7207	3.25%	30.0
L04	A653 Leeds Rd (Syke Rd to Heybeck La)	30762	4.43%	38.5	26151	5.27%	38.1
L05	Soothill La	11540	3.42%	30.0	9811	3.42%	30.0
L06	Heybeck La (Leeds Rd to Site Access 1)	8161	1.24%	31.5	6938	1.36%	31.4
L07	Heybeck La (East of Site Access 1)	8161	1.24%	31.5	6938	1.36%	31.4
L08	Site Access 1						
L09	A653 Leeds Rd (Heybeck La to Site Access 2)	29529	3.07%	40.3	25103	3.62%	40.1
L10	Site Access 2						
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	28878	2.97%	39.3	24549	3.53%	39.1
L12	Site Access 3						
L13	A653 Leeds Rd (Site Access 3 to Chidswell La)	28226	2.87%	38.3	23995	3.44%	38.1
L14	A653 Leeds Rd (Chidswell La to Owl La)	26175	5.49%	35.0	22252	5.49%	35.0

Link	Link Description	2019 AADT	2019 AADT HGV Propn. (%)	2019 AADT Mean speed (mph)	2019 18h AAWT	2019 18h AAWT HGV Propn. (%)	2019 18h AAWT Mean speed (mph)
L15	A653 Leeds Rd (Owl La to Challenge Wy)	18528	4.67%	30.0	15751	4.67%	30.0
L16	B6128 Challenge Wy	13558	6.92%	30.0	11526	6.92%	30.0
L17	A653 Leeds Rd (Challenge Wy to High St)	22642	4.12%	30.0	19248	4.12%	30.0
L18	High St	6100	3.76%	30.0	5186	3.76%	30.0
L19	A653 Leeds Rd (South of High St)	16519	4.24%	30.0	14043	4.24%	30.0
L20	B6128 John Ormsby VC Wy	17979	5.85%	30.0	15284	5.85%	30.0
L21	Owl La (A653 Leeds Rd to B6128 John Ormsby VC Wy)	8143	7.44%	30.0	6922	7.44%	30.0
L22	Horace Waller VC Parade	5173	10.87%	30.0	4398	10.87%	30.0
L23	B6128 Owl La (Horace Waller VC Parade to Windsor Rd)	25014	5.10%	30.0	21265	5.10%	30.0
L24	Chidswell La (A653 Leeds Rd to Site Access 4)	3561	0.33%	22.1	3027	0.34%	22.3
L25	Site Access 4						
L26	Chidswell La (Site Access 4 to Windsor Rd)	3061	0.33%	22.1	2602	0.34%	22.3
L27	Chidswell La (East of Windsor Rd)	441	6.32%	30.0	375	6.32%	30.0
L28	Windsor Rd	2743	3.10%	30.0	2332	3.10%	30.0
L29	B6128 Owl La (Windsor Rd to Dewsbury Rams access)	27248	1.53%	32.2	23163	1.74%	31.3
L30	Dewsbury Rams access	100	6.61%	15.0	85	6.61%	15.0

Table 13.5: 2019 AADT Link Flows cont.

Link	Link Description	2019 AADT	2019 AADT HGV Propn. (%)	2019 AADT Mean speed (mph)	2019 18h AAWT	2019 18h AAWT HGV Propn. (%)	2019 18h AAWT Mean speed (mph)
L31	B6128 Owl La (Dewsbury Rams access to Amberwood Ch)	27222	1.53%	32.2	23142	1.74%	31.3
L32	Amberwood Ch	1591	2.63%	20.0	1352	2.63%	20.0
L33	B6128 Owl La (East of Amberwood Ch)	26820	4.55%	40.0	22800	4.55%	40.0
L34	Site Access over Barratt land						
L35	Chidswell Lane (East of Barratt land)	441	6.32%	30.0	375	6.32%	30.0
L36	Site Access 5						
L37	B6128 Owl La (West of A638 rbt)	29072	1.60%	32.5	24714	1.77%	31.7
L38	A638 Chancery Rd	25814	8.04%	40.0	21945	8.04%	40.0
L39	B6128 Leeds Rd (East of A638 rbt)	17178	4.71%	30.0	14603	4.71%	30.0
L40	A638 Wakefield Rd (North of A638 rbt)	39232	8.03%	50.0	33351	8.03%	50.0
L41	A638 (West of M1 J40)	52345	4.77%	46.2	44499	5.36%	45.5
L42	M1 J40 NB onslip	23930	11.90%	70.0	20343	13.10%	70.0
L43	M1 J40 SB offslip	18820	13.50%	70.0	15999	15.20%	70.0
L44	A638 Wakefield Rd (East of M1 J40)	44261	7.97%	40.0	37627	7.97%	40.0
L45	M1 J40 SB onslip	13139	6.60%	70.0	11170	7.00%	70.0

Link	Link Description	2019 AADT	2019 AADT HGV Propn. (%)	2019 AADT Mean speed (mph)	2019 18h AAWT	2019 18h AAWT HGV Propn. (%)	2019 18h AAWT Mean speed (mph)
L46	M1 J40 NB offslip	11766	11.30%	70.0	10002	12.90%	70.0
L47	A653 Dewsbury Rd SB (South of M62 J28)	10653	3.84%	37.3	9056	4.57%	36.0
L48	A653 Dewsbury Rd NB (South of M62 J28)	22629	5.00%	34.6	19237	5.94%	36.0
L49	A650 Tingley Common WB	18155	6.07%	40.0	15434	6.07%	40.0
L50	A650 Tingley Common EB	16322	6.41%	40.0	13875	6.41%	40.0
L51	M62 J28 WB onslip	7827	9.10%	70.0	6654	10.20%	70.0
L52	M62 J28 EB offslip	9867	5.20%	70.0	8388	6.10%	70.0
L53	A653 Dewsbury Rd NB (North of M62 J28)	32788	3.83%	40.0	27873	3.83%	40.0
L54	A653 Dewsbury Rd SB (North of M62 J28)	13879	3.74%	40.0	11799	3.74%	40.0
L55	M62 J28 EB onslip	16888	7.82%	70.0	14357	7.82%	70.0
L56	M62 J28 WB offslip	17339	14.60%	70.0	14740	16.40%	70.0
L57	A650 Bradford Rd EB	13083	3.69%	40.0	11122	3.69%	40.0
L58	A650 Bradford Rd WB	19359	3.26%	40.0	16457	3.26%	40.0
L59	Dewsbury Ring Road	21934	1.58%	30.5	22859	2.99%	30.0
L60	Leeds Road	13715	2.84%	30.3	14196	1.83%	29.9
L61	A638 Wakefield Rd	25009	2.89%	30.6	26268	3.27%	29.6

Pedestrian Movement and Capacity

13.83 The majority of roads surrounding the Site, including Leeds Road, Heybeck Lane, Chidswell Lane and Windsor Road, have footways provided on both sides of the carriageway to facilitate pedestrian movement.

13.84 Along the A653 Leeds Road, good-quality footways are provided on both sides of the carriageway. Pedestrian crossing facilities are also provided at various junctions, providing pedestrian connectivity. Leeds Road is well lit and is considered safe for pedestrians.

13.85 Heybeck Lane also provides good quality wide footways on both sides of the carriageway. It is also well lit making this a safe walking environment for pedestrians

13.86 Chidswell Lane provides footways on both sides of the carriageway, which are also well lit.

13.87 Given the Site's current use as agricultural land, formal pedestrian facilities are absent however a network of public rights of way exists.

13.88 Overall pedestrian flows have been observed to be very low and it is not considered that there are any capacity constraints to the current pedestrian network in the area.

Pedestrian Severance, Delay, Fear and Imitation, Amenities

13.89 IMEA guidance on pedestrian severance (as detailed above) is focussed on the effect of a relative change in traffic flow, rather than an appreciation of the existing state of a network and the resulting effects of any change on that basis. Similarly, a consideration of percentage changes in traffic flow does not take into account the existing level of flow: for example, a 90% increase in a very low level of traffic may still objectively result in a very low level of traffic, whereas a 90% increase in traffic on a well-used major road is unlikely to have any practical effect on severance when the existing level of severance is already likely to be substantial.

13.90 Consequently, for the purpose of baseline, the following severance details are noted:

- As a dual carriageway road with limited crossing points, Leeds Road is likely to provide a moderate severance between properties on either side of the Road.
- As B-classified single-carriageway roads with substantial traffic, Owl Lane and Heybeck Lane are likely to provide a slight severance.
- As minor residential roads with low levels of traffic, Chidswell Lane and Windsor Road are likely to provide negligible severance.

13.91 Pedestrian delay in the baseline is likely to be experienced at junctions and other crossing points. At controlled crossings this is imposed by signals, at other locations by the need to wait for gaps in traffic flow in order to safely cross. Increased vehicle flows, and/or circuitous diversions to pedestrians will increase delays to pedestrian movements.

13.92 IMEA traffic thresholds for fear and intimidation are specified and replicated above. Table 13.6 and Table 13.7 below summarise each of the three assessment items for the 2019 base situation.

Table 13.6: 2019 Link Fear and Intimidation

Link	Link Description	2019 AAWT Avg per hour	Fear / Intim. based on flow	2019 18h HGV AAWT	Fear / Intim. based on HGVs	2019 AAWT Mean Speed (mph)	Fear / Intim. based on speed
L01	A653 Dewsbury Road (Hesketh La to Syke Rd)	1367	Great	1298	Moderate	40.0	Extreme
L02	Rein Rd	592	Negligible	234	Negligible	20.0	Extreme
L03	Syke Rd	400	Negligible	234	Negligible	30.0	Extreme
L04	A653 Leeds Rd (Syke Rd to Heybeck La)	1453	Great	1379	Moderate	38.1	Extreme
L05	Soothill La	545	Negligible	335	Negligible	30.0	Extreme
L06	Heybeck La (Leeds Rd to Site Access 1)	385	Negligible	94	Negligible	31.4	Extreme
L07	Heybeck La (East of Site Access 1)	385	Negligible	94	Negligible	31.4	Extreme
L08	Site Access 1						
L09	A653 Leeds Rd (Heybeck La to Site Access 2)	1395	Great	909	Negligible	40.1	Extreme
L10	Site Access 2						
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	1364	Great	867	Negligible	39.1	Extreme
L12	Site Access 3						
L13	A653 Leeds Rd (Site Access 3 to Chidswell La)	1333	Great	826	Negligible	38.1	Extreme
L14	A653 Leeds Rd (Chidswell La to Owl La)	1236	Great	1222	Moderate	35.0	Extreme
L15	A653 Leeds Rd (Owl La to Challenge Wy)	875	Moderate	736	Negligible	30.0	Extreme
L16	B6128 Challenge Wy	640	Moderate	797	Negligible	30.0	Extreme
L17	A653 Leeds Rd (Challenge Wy to High St)	1069	Moderate	792	Negligible	30.0	Extreme
L18	High St	288	Negligible	195	Negligible	30.0	Extreme
L19	A653 Leeds Rd (South of High St)	780	Moderate	595	Negligible	30.0	Extreme
L20	B6128 John Ormsby VC Wy	849	Moderate	894	Negligible	30.0	Extreme
L21	Owl La (A653 Leeds Rd to B6128 John Ormsby VC Wy)	385	Negligible	515	Negligible	30.0	Extreme
L22	Horace Waller VC Parade	244	Negligible	478	Negligible	30.0	Extreme

Link	Link Description	2019 AAWT Avg per hour	Fear / Intim. based on flow	2019 18h HGV AAWT	Fear / Intim. based on HGVs	2019 AAWT Mean Speed (mph)	Fear / Intim. based on speed
L23	B6128 Owl La (Horace Waller VC Parade to Windsor Rd)	1181	Moderate	1084	Moderate	30.0	Extreme
L24	Chidswell La (A653 Leeds Rd to Site Access 4)	168	Negligible	10	Negligible	22.3	Extreme
L25	Site Access 4						
L26	Chidswell La (Site Access 4 to Windsor Rd)	145	Negligible	9	Negligible	22.3	Extreme
L27	Chidswell La (East of Windsor Rd)	21	Negligible	24	Negligible	30.0	Extreme
L28	Windsor Rd	130	Negligible	72	Negligible	30.0	Extreme
L29	B6128 Owl La (Windsor Rd to Dewsbury Rams access)	1287	Great	402	Negligible	31.3	Extreme
L30	Dewsbury Rams access	5	Negligible	6	Negligible	15.0	Great

Table 13.7: 2019 AADT Link Flows cont.

Link	Link Description	2019 AAWT Avg per hour	Fear / Intim. based on flow	2019 18h HGV AAWT	Fear / Intim. based on HGVs	2019 AAWT Mean Speed (mph)	Fear / Intim. based on speed
L31	B6128 Owl La (Dewsbury Rams access to Amberwood Ch)	1286	Great	402	Negligible	31.3	Extreme
L32	Amberwood Ch	75	Negligible	36	Negligible	20.0	Extreme
L33	B6128 Owl La (East of Amberwood Ch)	1267	Great	1037	Moderate	40.0	Extreme
L34	Site Access over Barratt land						
L35	Chidswell Lane (East of Barratt land)	21	Negligible	24	Negligible	30.0	Extreme
L36	Site Access 5	0	Negligible	0	Negligible	25.0	Extreme
L37	B6128 Owl La (West of A638 rbt)	1373	Great	438	Negligible	31.7	Extreme
L38	A638 Chancery Rd	1219	Great	1765	Moderate	40.0	Extreme
L39	B6128 Leeds Rd (East of A638 rbt)	811	Moderate	688	Negligible	30.0	Extreme
L40	A638 Wakefield Rd (North of A638 rbt)	1853	Extreme	2677	Great	50.0	Extreme
L41	A638 (West of M1 J40)	2472	Extreme	2386	Great	45.5	Extreme
L42	M1 J40 NB onslip	1130	Moderate	2665	Great	70.0	Extreme
L43	M1 J40 SB offslip	889	Moderate	2432	Great	70.0	Extreme
L44	A638 Wakefield Rd (East of M1 J40)	2090	Extreme	2997	Great	40.0	Extreme
L45	M1 J40 SB onslip	621	Moderate	782	Negligible	70.0	Extreme
L46	M1 J40 NB offslip	556	Negligible	1290	Moderate	70.0	Extreme
L47	A653 Dewsbury Rd SB (South of M62 J28)	503	Negligible	414	Negligible	36.0	Extreme
L48	A653 Dewsbury Rd NB (South of M62 J28)	1069	Moderate	1143	Moderate	36.0	Extreme
L49	A650 Tingley Common WB	857	Moderate	937	Negligible	40.0	Extreme
L50	A650 Tingley Common EB	771	Moderate	889	Negligible	40.0	Extreme
L51	M62 J28 WB onslip	370	Negligible	679	Negligible	70.0	Extreme
L52	M62 J28 EB offslip	466	Negligible	512	Negligible	70.0	Extreme
L53	A653 Dewsbury Rd NB (North of M62 J28)	1549	Great	1067	Moderate	40.0	Extreme

L54	A653 Dewsbury Rd SB (North of M62 J28)	655	Moderate	441	Negligible	40.0	Extreme
L55	M62 J28 EB onslip	798	Moderate	1123	Moderate	70.0	Extreme
L56	M62 J28 WB offslip	819	Moderate	2417	Great	70.0	Extreme
L57	A650 Bradford Rd EB	618	Moderate	410	Negligible	40.0	Extreme
L58	A650 Bradford Rd WB	914	Moderate	536	Negligible	40.0	Extreme
L59	Dewsbury Ring Road	1270	Great	683	Negligible	30.0	Extreme
L60	Leeds Road	789	Moderate	260	Negligible	29.9	Extreme
L61	A638 Wakefield Rd	1459	Great	858	Negligible	29.6	Extreme

13.93 As might be anticipated, based on flow levels alone, the entire assessed length of the A653 (Leeds Road / Dewsbury Rd) is subject to non-negligible effect in terms of fear and intimidation. Also subject to non-negligible effects are the B6128 (Owl Lane), the A683 (Wakefield Road) and the various motorway slip roads within the assessment area. The same applies to fear/intimidation based on HGV flows, although this effect is generally less severe. Vehicle speeds are shown as being a poor proxy for fear/intimidation, given the nature of the roads involved and as every link classifies as 'Extreme', save for the current access to the Dewsbury Rams.

Cycling Facilities

13.94 Cycling provision is available in the local area with cycle lanes being provided on Leeds Road adjacent to the Site. In addition, towns such as Wakefield, Horbury, Morley and Middleton can all be reached by bicycle within 30 minutes via existing cycle routes and Public Rights of Way (PROWs).

13.95 The Site is connected to various destinations via several National Cycle Network (NCN) routes. NCN route 69 connects Dewsbury with Ravensthorpe and, in turn via NCN route 66, with Huddersfield and Bradford. NCN route 69 also connects Dewsbury with Ossett and, in turn via NBCN route 699, to the 'Wakefield Wheel'.

13.96 To the north of the Site, there are several local traffic-free cycle routes that link Tingley to Beeston and Middleton to Leeds city centre.

Public Transport: Bus services

13.97 The Site is well connected by the local bus network, being served by a large number of existing bus routes providing convenient key links to major employment areas and town centres elsewhere in the Kirklees District and beyond. There are various existing bus stops located in close proximity to the Site, including at the western and southern edges of the Site, with bus stops situated along the A653 Leeds Road and Chidswell Lane respectively.

13.98 The Site's western edge, along Leeds Road, has three bus stops. These are served by routes 117, 202, 203, 205 and 217; routes 202 and 203 run from Huddersfield to Leeds via Dewsbury, i.e. connecting to nearby major employment centres, with other routes connecting to other local centres such as Batley, Ossett and Wakefield. All routes are generally of low frequency at 1 bus per hour on weekday daytimes, with the exceptions of the 202/203 service which operates four buses per hour, and route 2017 which operates on weekday peaks only.

13.99 The Site's southern edge is also served by route 205 and additionally routes 119, 120 and ML2. Route ML2 connects Chidswell with Dewsbury town centre by five buses a day (Monday to Saturday), once an hour between 10:00 and 14:00 hours, offering a 'hail-and-ride' service for most of the route. Routes 119 and 120 link Wakefield to Batley via Chidswell.

13.100 The Site is also served by nearby local bus routes 117, 205, 212 and 212A in both directions along Heybeck Lane. Routes 117 and 217 connect Wakefield with Leeds via Chidswell; route 205 connects Dewsbury with Pudsey; and routes 212/212A connect Wakefield with Batley, to the west, providing a direct bus service between the Site and Batley Rail Station. These routes generally all operate 1 bus per hour on weekday daytimes, and a lower frequency of service in the evenings and at weekends.

Public Transport: Rail services

13.101 There are two mainline railway stations located within relatively close proximity to the Site. Batley Railway Station is located approximately 2.5km to the west and Dewsbury Railway Station is located approximately 3.5km to the south-west. Services are provided by Northern Trains and TransPennine Express – connecting to Leeds, Huddersfield, York, Manchester and the wider national network – and operate a total of four trains per hour each way in the weekday off-peak.

13.102 The Site is within the Leeds Metro Rail Zonal fare system with the border of Zones 2 and 3 being between Batley and Dewsbury Stations.

13.103 Both stations can be accessed via existing bus routes and bus stops are provided close to both stations. Dewsbury Station also has a dedicated public transport interchange facility located directly outside the station.

Junction Capacity and Driver Delay

13.104 Junction capacity assessment results are presented, for non-signalised junctions, in terms of 'Ratio of Demand Flow to Capacity' ('RFC'), expressed as a factor; and for signal-controlled junctions, in terms of 'Degrees of Saturation' ('DoS'), expressed as a percentage (%).

13.105 For non-signalised junctions, an RFC of less than 0.85 indicates that the junction is operating within its theoretical capacity; an RFC of equal to or greater than 0.85 but less than 1.00 indicates that the junction is approaching its capacity; and an RFC of equal to or greater than 1.00 indicates that it has either reached or exceeded its capacity.

13.106 For signal-controlled junctions, a DoS of less than 90% indicates that the junction is operating within its theoretical capacity; a DoS of equal to or greater than 90% but less than 100% indicates that the junction is approaching its capacity; and a DoS of equal to or greater than 100% indicates that it has either reached or exceeded its theoretical capacity.

Table 13.8: Junction Assessment Criteria

Operational Implication	Non-Signalised Junctions	Signal-Controlled Junction
Within capacity	RFC of less than 0.85	DoS of less than 90%
Approaching capacity but operations and delay highly sensitive to flow changes	RFC of equal to or greater than 0.85 but less than 1.00	DoS of equal to or greater than 90% but less than 100%
At or over capacity	RFC of equal to or greater than 1.00	DoS of equal to or greater than 100%

13.107 The junction capacity assessment of the 2019 baseline has been assessed using Junctions9 (ARCADY and PICADY) and LINSIG software packages. A summary of the baseline results of modelling the existing flows, highlighting those with existing capacity issues, are shown in Table 13.9 below.

13.108 Please refer to the TA (Appendices H-W) for further information.

Table 13.9: 2019 Observed Junction Capacity Assessment

Junction	Name of Junction	Worst Performing Arm	Maximum Arm DoS / RFC (AM)	Maximum Arm DoS / RFC (PM)
1	M1 Junction 40 (Flushdyke Interchange) – signal-controlled roundabout	A638	100.6%	89.1%

Junction	Name of Junction	Worst Performing Arm	Maximum Arm DoS / RFC (AM)	Maximum Arm DoS / RFC (PM)
2	M62 Junction 28 (Tingley Interchange) – signal-controlled roundabout	M62 J28 Off-Slip	90.2%	93.1%
3	A653 Leeds Road / Heybeck Lane – signal-controlled junction	Soothill La	94.1%	82.6%
4	A653 Leeds Road / Chidswell Lane – priority T-junction	All Arms within Capacity	0.41	0.13
5	A653 Leeds Road / B6128 Challenge Way / B6128 John Ormsby V C Way (Shaw Cross Junction) – signal-controlled junction, both existing and KC proposed improvement	All Arms within Capacity	89.9%	82.4%
6	B6128 Owl Lane / Windsor Road – priority T-junction	All Arms within Capacity	0.84	0.25
7	A638 Wakefield Road / A638 Chancery Road / B6128 Owl Lane / B6128 Leeds Road – priority roundabout	Wakefield Road A638	1.03	0.99
8	Chidswell Lane / Windsor Road – priority T-junction	All Arms within Capacity	0.03	0.06
9	A653 Leeds Road / Owl Lane – signal-controlled junction	All Arms within Capacity	75.1%	70.0%
10	B6128 John Ormsby V C Way / B6128 Owl Lane / Horace Waller V C Parade – priority roundabout;	All Arms within Capacity	0.79	0.57
11	A653 Leeds Road / A6209 Rein Road / A653 Dewsbury Road / Syke Road – signal-controlled junction	All Arms within Capacity	85.2%	77.0%
12	Owl Lane / Dewsbury Rams Access – Priority junction	All Arms within Capacity	0.02	0.04
13	Owl Lane / Amberwood Close	All Arms within Capacity	0.44	0.23
14	Site Access 1	n/a	n/a	n/a
15	Site Access 4	n/a	n/a	n/a
16	Site Access 5	n/a	n/a	n/a

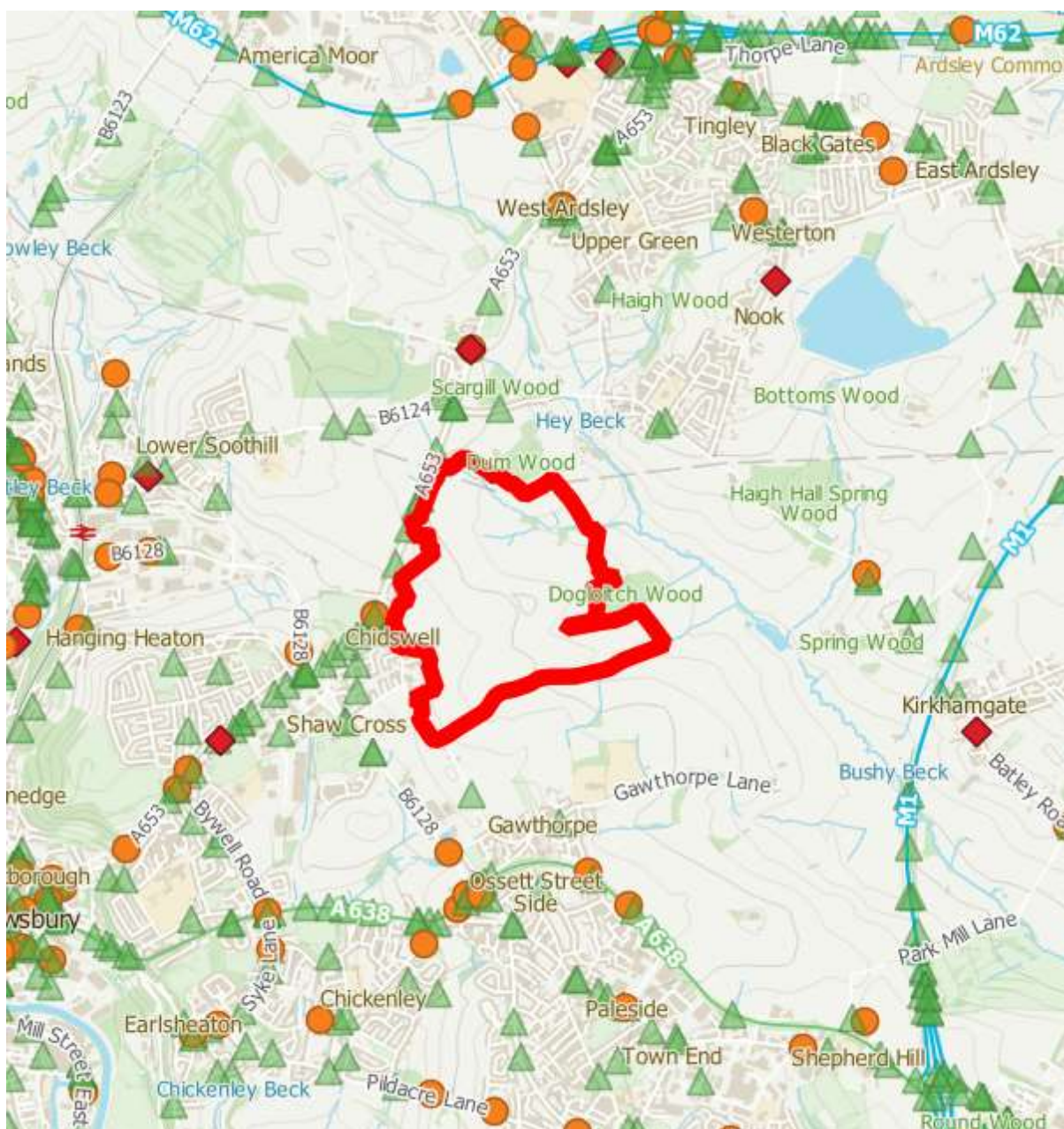
Road Traffic Collision and Safety Data

13.109 Accident data has been collated for the most recent 5 full years for which data is available, 2014-2018 inclusive. No fatalities were recorded in the immediate surroundings of the Site, however 3 fatalities were recorded across the wider study area. There were 14 'serious' severity accidents and approximately 87 'slight' severity accidents across the study area. This

is broadly in line with general expectations⁵⁸ where approximately 10–15% (varying depending on link type) of the overall number of accidents are expected to be of serious severity, and in this case comprise 14%.

13.110 The study area is diverse in road type and traffic levels, so focus here is on the most severe (i.e. fatal) accidents within the study area. It should be noted that highway safety is a matter of ongoing duty, focus and review by all local highway authorities. It is not anticipated that the Proposed Development would have any specific effects with regard to highway safety.

Figure 13.1 – Collision Data



13.111 A single fatal accident was recorded over the 2014-2018 period within the study area at the junction of A639 Leeds/Dewsbury Road and Quarry Lane, a priority access junction (approximately 330m to the north of the junction with Heybeck Lane) which provides access to a small number of residential properties, some industrial units, and Howley Park Quarry. In

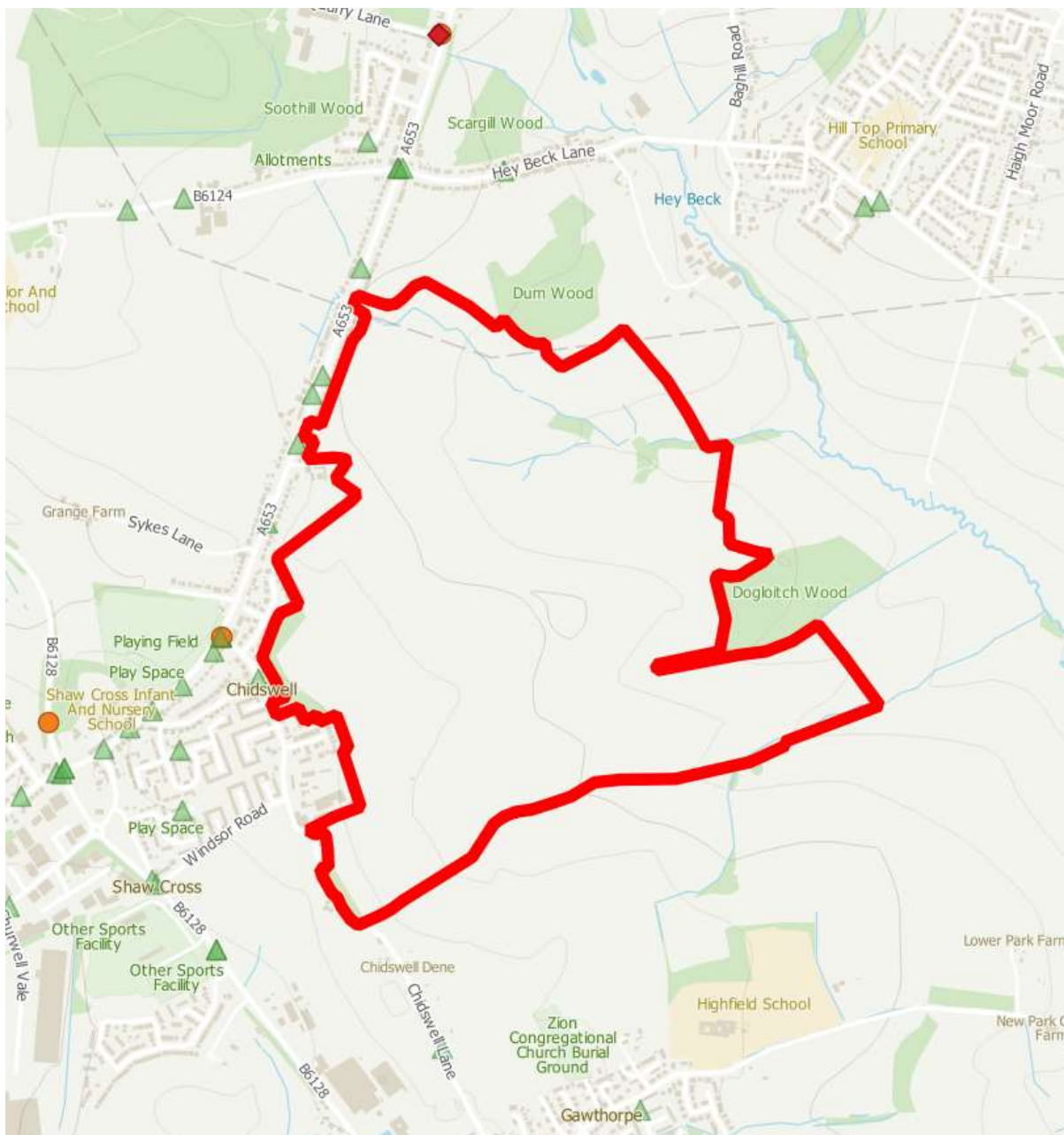
⁵⁸ As defined by the accident severity proportions summarised in the COBA Manual, Design Manual for Roads and Bridges, 13(s1, pt2), published and maintained by the Department for Transport, June 2006.

2016, a rigid HGV turning right at the junction struck and killed a pedestrian who was crossing the carriageway. No formal crossing facilities exist at this location, but residential property frontage along the length of Leeds Road is likely to result in north-south pedestrian desire lines across the minor road.

13.112 Two fatal accidents were recorded in 2015 on A650 Tingley Common to the west of Tingley Interchange (M62 J28). The first involved a cyclist being struck and killed by a car. There are (and were) advisory on-carriageway cycle lanes on this (2x 2 lane) dual carriageway road, however the road is wide and subject to a 40mph speed limit and so this is likely to provide a poor cycling experience and would be hazardous if, for example, a cyclist was forced to deviate from the marked cycle lane by debris or poor road surface.

13.113 The second accident on this section of road was a motorcyclist being struck and killed by a heavy goods vehicle performing a 'U-turn' manoeuvre. Whilst there is a planting gap in the central reservation strip which was likely used, it cannot be characterised as formal provision, nor would this location appear to be reasonable for such a manoeuvre. There does not appear to be an obvious reason for the retention of this gap, so it could be recommended that this gap is formally closed by way of upgrade to the current semi-permanent 'swing-back' bollards.

Figure 13.2 Local Collision Data



13.114 Recorded accidents are broadly distributed along the length of A639 Leeds Road adjacent to the Site. Some limited clustering is visible at junctions as would be expected. A high-level link accident rate analysis has been performed to establish if the outturn rate of accidents in this area is unexpectedly high, as new accesses are proposed along this stretch of road. However, any new accesses would be delivered to modern highway standards and thus would be expected to have negligible or improvement effect.

Table 13.10: Collision Data

Year	Accident Count	AADT	Million Veh km	Expected Rate	Recorded PIA/Mvkm
2014	3	19744	8.648	0.841	0.347
2015	3	19744	8.648	0.864	0.347
2016	3	19744	8.672	0.827	0.346
2017	1	19744	8.648	0.821	0.347
2018	2	19744	8.648	0.814	0.347

13.115 A comparison of recorded accident numbers for this link with expected 'link & junction' accident rates for the appropriate type of road (Department for Transport, WebTAG COBALT

v0.1, 2014) indicates that A639 Leeds Road (adjacent to the Site) has an accident rate approximately half that which might be expected. The low number of accidents makes it difficult to establish any robust trend, but it can be noted that fewer accidents were recorded in the last two years for which data is available (2017 and 2018).

Identification and Evaluation of Likely Significant Effects

Construction phase

13.116 The construction phasing and build-out rate for the Site is to be confirmed. Assumptions regarding residential and non-residential build out have been made for the purposes of the Transport Assessment (TA), that assume partial build-out by the 2024 interim future assessment year and full build-out by the 2030 further future assessment year. These assumptions are for the purpose of assessing transport effects only.

13.117 The temporary construction phase associated with the Proposed Development would result in:

- Temporary increases in Heavy Good Vehicle (HGV) movements on the highway network in the vicinity of the Site;
- Introduction of construction workers to the Site; and
- Temporary closure of footways.

13.118 Given the nature of the construction required, the programme for same, the outline nature of the planning application and the long-period of delivery, construction traffic volumes and temporal profiles cannot be determined at this stage.

13.119 A plan for construction management will be the responsibility of the eventual delivery contractor(s). Such a plan would include appropriate estimates of construction traffic, routing and mechanisms for managing same. It would be expected that the majority of construction vehicles would access the Site from the M62 or M1 junctions (i.e. from the Strategic Road Network; see Chapter 5: Construction Programme and Methodology).

13.120 Transportation and access related effects that have the potential to arise during the construction stages would comprise the following:

- Temporary disruption to road users at specific times of the day from vehicles accessing and egressing the Site;
- Temporary disruption to cyclists at specific times of the day from vehicles accessing and egressing the Site; and
- Temporary disruption to pedestrians at specific times of the day from vehicles accessing and egressing the Site.

13.121 Construction traffic is therefore considered to have a **minor adverse medium-term effect**.

Operational phase

13.122 The Applicant and the Design Team have aimed to deliver a scheme that appropriately responds to the immediate Site context and district-wide needs for mitigation relating to transport and access.

13.123 The Proposed Development would have the potential for the following broad effects:

- Increased people trips travelling to and from the Site and an associated demand on pedestrian, cycle, public transport facilities and the local road network; and
- New/upgraded access points into the Proposed Development including new pedestrian and cycle routes.

13.124 The remainder of this section considers the previously identified assessment items in detail.

Local Highway Network and Existing Traffic Conditions

13.125 The assessment of the effects of changes on the local highway network are considered in subsequent sections in terms of their effects on the given category. The following summarises the changes in flow distribution and volume on the network to 2024 both with and without the delivery of the Proposed Development anticipated by that time, and to 2030 both with and without the complete and operational development.

Table 13.11: 2024 AADT Link Flows

Link	Link Description	2024 AADT Without Dev.	% Increase over 2019	2024 AADT With Dev.	% Increase over 2019
L01	A653 Dewsbury Road (Hesketh La to Syke Rd)	31642	9.3%	32360	11.8%
L02	Rein Rd	13385	6.8%	13435	7.2%
L03	Syke Rd	9180	8.3%	9180	8.3%
L04	A653 Leeds Rd (Syke Rd to Heybeck La)	34386	11.8%	35155	14.3%
L05	Soothill La	12066	4.6%	12458	8.0%
L06	Heybeck La (Leeds Rd to Site Access 1)	11146	36.6%	11208	37.3%
L07	Heybeck La (East of Site Access 1)	10302	26.2%	10364	27.0%
L08	Site Access 1	1009		1009	
L09	A653 Leeds Rd (Heybeck La to Site Access 2)	34691	17.5%	35915	21.6%
L10	Site Access 2	0		2174	
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	33014	14.3%	33965	17.6%
L12	Site Access 3	0		0	
L13	A653 Leeds Rd (Site Access 3 to Chidswell La)	31337	11.0%	32288	14.4%
L14	A653 Leeds Rd (Chidswell La to Owl La)	29051	11.0%	30002	14.6%
L15	A653 Leeds Rd (Owl La to Challenge Wy)	20733	11.9%	21176	14.3%
L16	B6128 Challenge Wy	14259	5.2%	14259	5.2%
L17	A653 Leeds Rd (Challenge Wy to High St)	25687	13.4%	26129	15.4%
L18	High St	7888	29.3%	7888	29.3%
L19	A653 Leeds Rd (South of High St)	17976	8.8%	18418	11.5%
L20	B6128 John Ormsby VC Wy	19037	5.9%	19037	5.9%
L21	Owl La (A653 Leeds Rd to B6128 John Ormsby VC Wy)	8872	9.0%	9380	15.2%
L22	Horace Waller VC Parade	5389	4.2%	5498	6.3%
L23	B6128 Owl La (Horace Waller VC Parade to Windsor Rd)	26704	6.8%	27103	8.4%
L24	Chidswell La (A653 Leeds Rd to Site Access 4)	4049	13.7%	4049	13.7%
L25	Site Access 4	0		0	
L26	Chidswell La (Site Access 4 to Windsor Rd)	4666	52.4%	4666	52.4%
L27	Chidswell La (East of Windsor Rd)	503	14.0%	503	14.0%
L28	Windsor Rd	4294	56.6%	4294	56.6%
L29	B6128 Owl La (Windsor Rd to Dewsbury Rams access)	29020	6.5%	29419	8.0%
L30	Dewsbury Rams access	100	0.0%	100	0.0%

Table 13.12: 2024 AADT Link Flows cont.

Link	Link Description	2024 AADT Without Dev.	% Increase over 2019	2024 AADT With Dev.	% Increase over 2019
L31	B6128 Owl La (Dewsbury Rams access to Amberwood Ch)	30868	6.8%	35743	8.2%
L32	Amberwood Ch	1591	0.0%	1591	0.0%
L33	B6128 Owl La (East of Amberwood Ch)	30403	6.7%	35279	8.2%
L34	Site Access over Barratt land	0		7538	
L35	Chidswell Lane (East of Barratt land)	569	14.0%	569	14.0%
L36	Site Access 5	0		7538	
L37	B6128 Owl La (West of A638 rbt)	29448	-0.4%	34323	1.0%
L38	A638 Chancery Rd	26528	2.6%	26702	2.6%
L39	B6128 Leeds Rd (East of A638 rbt)	13687	-12.0%	14493	-11.3%
L40	A638 Wakefield Rd (North of A638 rbt)	43181	6.1%	47077	6.8%
L41	A638 (West of M1 J40)	55338	4.5%	59233	5.0%
L42	M1 J40 NB onslip	22668	-1.9%	23313	-1.9%
L43	M1 J40 SB offslip	20996	7.3%	21207	7.3%
L44	A638 Wakefield Rd (East of M1 J40)	41234	-2.1%	42800	-1.9%
L45	M1 J40 SB onslip	14472	6.8%	15507	7.0%
L46	M1 J40 NB offslip	13293	5.6%	13732	7.1%
L47	A653 Dewsbury Rd SB (South of M62 J28)	14230	17.0%	16315	23.0%
L48	A653 Dewsbury Rd NB (South of M62 J28)	20805	-14.4%	26438	-14.0%
L49	A650 Tingley Common WB	20677	7.9%	20677	7.9%
L50	A650 Tingley Common EB	16443	0.8%	16443	0.8%
L51	M62 J28 WB onslip	10111	13.9%	11995	14.3%
L52	M62 J28 EB offslip	7878	-10.5%	8601	-8.1%
L53	A653 Dewsbury Rd NB (North of M62 J28)	31601	-1.7%	34162	-1.7%
L54	A653 Dewsbury Rd SB (North of M62 J28)	12969	-4.3%	13810	-3.3%
L55	M62 J28 EB onslip	4799	-53.7%	5887	-53.6%
L56	M62 J28 WB offslip	18030	3.2%	18494	4.5%
L57	A650 Bradford Rd EB	14593	8.8%	14694	8.8%
L58	A650 Bradford Rd WB	19886	0.2%	19944	0.4%
L59	Dewsbury Ring Road	23927	5.4%	30162	7.4%
L60	Leeds Road	16282	10.0%	22517	13.3%
L61	A638 Wakefield Rd	25665	2.7%	25665	2.7%

13.126 A comparison of 2024 data with 2019 data (Tables 13.4, 13.5 and 13.11, 13.12) shows a wide range of changes across the network in the 'Without Development' scenario. Some of the largest changes are on links around the M62 J28 which likely relate to changes on the Strategic Road Network such as planned improvements to other junctions which result in redistribution of traffic away from this junction. Other large proportion changes are usually related to small overall numerical changes on links with low flows, thus forming a higher proportional change.

13.127 The 'With Development' scenario shows the highest proportional increases, as would be expected, on roads close to the Site with increases of up to 10% on Heybeck Lane to the immediate west of the Site, and a little under 6% to the north of the Site on Dewsbury Road. In any case, these increases are likely to be within the range of daily variation.

Table 13.13: 2030 AADT Link Flows

Link	Link Description	2030 AADT Without Dev.	% Increase over 2019	2030 AADT With Dev.	% Increase over 2019
L01	A653 Dewsbury Road (Hesketh La to Syke Rd)	34363	18.7%	42082	45.3%
L02	Rein Rd	14359	14.5%	15300	22.0%
L03	Syke Rd	9719	14.6%	9719	14.6%
L04	A653 Leeds Rd (Syke Rd to Heybeck La)	38746	26.0%	47406	54.1%
L05	Soothill La	12575	9.0%	14981	29.8%
L06	Heybeck La (Leeds Rd to Site Access 1)	13807	69.2%	14392	76.3%
L07	Heybeck La (East of Site Access 1)	12280	50.5%	12865	57.6%
L08	Site Access 1	1826		1826	
L09	A653 Leeds Rd (Heybeck La to Site Access 2)	40475	37.1%	52127	76.5%
L10	Site Access 2	0		2836	
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	37495	29.8%	48792	69.0%
L12	Site Access 3	0		10943	
L13	A653 Leeds Rd (Site Access 3 to Chidswell La)	34515	22.3%	40582	43.8%
L14	A653 Leeds Rd (Chidswell La to Owl La)	31889	21.8%	42338	61.7%
L15	A653 Leeds Rd (Owl La to Challenge Wy)	22954	23.9%	29121	57.2%
L16	B6128 Challenge Wy	14918	10.0%	17967	32.5%
L17	A653 Leeds Rd (Challenge Wy to High St)	28613	26.4%	34848	53.9%
L18	High St	9936	62.9%	9936	62.9%
L19	A653 Leeds Rd (South of High St)	19093	15.6%	25328	53.3%
L20	B6128 John Ormsby VC Wy	19894	10.7%	23011	28.0%
L21	Owl La (A653 Leeds Rd to B6128 John Ormsby VC Wy)	9589	17.8%	13871	70.3%
L22	Horace Waller VC Parade	5536	7.0%	6684	29.2%
L23	B6128 Owl La (Horace Waller VC Parade to Windsor Rd)	28352	13.3%	35236	40.9%
L24	Chidswell La (A653 Leeds Rd to Site Access 4)	4537	27.4%	8919	150.5%
L25	Site Access 4	0		5643	
L26	Chidswell La (Site Access 4 to Windsor Rd)	7251	136.9%	8511	178.1%
L27	Chidswell La (East of Windsor Rd)	569	28.9%	569	28.9%
L28	Windsor Rd	6814	148.4%	8075	194.4%
L29	B6128 Owl La (Windsor Rd to Dewsbury Rams access)	30751	12.9%	38896	42.7%
L30	Dewsbury Rams access	100	0.0%	100	0.0%

Table 13.14: 2030 AADT Link Flows cont.

Link	Link Description	2030 AADT Without Dev.	% Increase over 2019	2030 AADT With Dev.	% Increase over 2019
L31	B6128 Owl La (Dewsbury Rams access to Amberwood Ch)	30868	13.4%	35743	31.3%
L32	Amberwood Ch	1591	0.0%	1591	0.0%
L33	B6128 Owl La (East of Amberwood Ch)	30403	13.4%	35279	31.5%
L34	Site Access over Barratt land	0		7538	
L35	Chidswell Lane (East of Barratt land)	569	28.9%	569	28.9%
L36	Site Access 5	0		7538	
L37	B6128 Owl La (West of A638 rbt)	29448	1.3%	34323	18.1%
L38	A638 Chancery Rd	26528	2.8%	26702	3.4%
L39	B6128 Leeds Rd (East of A638 rbt)	13687	-20.3%	14493	-15.6%
L40	A638 Wakefield Rd (North of A638 rbt)	43181	10.1%	47077	20.0%
L41	A638 (West of M1 J40)	55338	5.7%	59233	13.2%
L42	M1 J40 NB onslip	22668	-5.3%	23313	-2.6%
L43	M1 J40 SB offslip	20996	11.6%	21207	12.7%
L44	A638 Wakefield Rd (East of M1 J40)	41234	-6.8%	42800	-3.3%
L45	M1 J40 SB onslip	14472	10.1%	15507	18.0%
L46	M1 J40 NB offslip	13293	13.0%	13732	16.7%
L47	A653 Dewsbury Rd SB (South of M62 J28)	14230	33.6%	16315	53.2%
L48	A653 Dewsbury Rd NB (South of M62 J28)	20805	-8.1%	26438	16.8%
L49	A650 Tingley Common WB	20677	13.9%	20677	13.9%
L50	A650 Tingley Common EB	16443	0.7%	16443	0.7%
L51	M62 J28 WB onslip	10111	29.2%	11995	53.2%
L52	M62 J28 EB offslip	7878	-20.2%	8601	-12.8%
L53	A653 Dewsbury Rd NB (North of M62 J28)	31601	-3.6%	34162	4.2%
L54	A653 Dewsbury Rd SB (North of M62 J28)	12969	-6.6%	13810	-0.5%
L55	M62 J28 EB onslip	4799	-71.6%	5887	-65.1%
L56	M62 J28 WB offslip	18030	4.0%	18494	6.7%
L57	A650 Bradford Rd EB	14593	11.5%	14694	12.3%
L58	A650 Bradford Rd WB	19886	2.7%	19944	3.0%
L59	Dewsbury Ring Road	23927	9.1%	30162	37.5%
L60	Leeds Road	16282	18.7%	22517	64.2%
L61	A638 Wakefield Rd	25665	2.6%	25665	2.6%

13.128 A comparison of 2030 AADTs against 2019 data for all links is shown for completeness in the tables above. As above, the projected changes are substantial over the period concerned and include decreases where traffic is likely to have redistributed on a strategic basis within the KC SATURN model. Generally, increases are greatest on those links with current capacity available (e.g. Leeds Road), and the least on those links which already exhibit capacity issues (e.g. Dewsbury Rd north of the M62).

13.129 The addition of Proposed Development traffic represents a substantive uplift on the 'Without Development' scenario. Flows in the immediate surroundings of the Site, generally increase in the order of 20%-30%. Flows further from the Site generally increase by lower net amounts, with flows around the SRN junctions being generally negligible and/or less than 10%. Some increases adjacent to the Site appear proportionately dramatic at around a 200% increase, however these are from a low base and represent increases of less than 500veh/h in the AM peak.

13.130 Five points of vehicular access are provided from the local highway network into the Site and an internal through road will be provided. Further design including internal distributor roads and on-Site car parking will be laid out in the detailed application.

13.131 An assessment of the significance of these traffic changes is captured in the relevant sections below.

Pedestrian Movement and Capacity

13.132 The significance of the increase in pedestrian flow has been assessed using professional judgement in conjunction with the TRICS assessment (summarised below) and mode share (approximately 10% of trips).

Table 13.15: Pedestrian trip generation by Proposed Development

Time Period (Hour commencing)	2024 Two-way Development Walking Trip Generation	2030 Two-way Development Walking Trip Generation
07:00	12	130
08:00	22	255
09:00	11	170
10:00	5	124
11:00	9	136
12:00	10	160
13:00	10	145
14:00	7	147
15:00	10	197
16:00	18	223
17:00	18	239
18:00	5	170
Total	137	2096

13.133 The Proposed Development would provide pedestrian footways on both sides of the Site access roads to encourage pedestrian travel to local facilities and the on-Site employment. Additionally, a large proportion of pedestrian trips would be expected to be between points internal to the Site. Trips within the Site will be accommodated by comprehensive provision of pedestrian infrastructure on all roads and through the incorporation of the existing public rights of way network.

13.134 Off the Site, general pedestrian flows are low and there are no obvious pedestrian infrastructure capacity pressures. The additional loading of pedestrians outside the Site would therefore be expected to have a negligible effect. In combination with the upgrade of the condition of the public rights of way network within the Site, the overall effect is considered to be a **long-term beneficial minor effect**.

Pedestrian Severance, Delay, Fear and Imitation, Amenity

13.135 The IEMA Guidelines have been used to determine the effect of traffic flows. The IEMA Guidelines state that the flows should be assessed when traffic flows have increased by more than 30% or in sensitive area of increases of 10%. Given the limitations of that methodology where flows vary across a range of magnitudes, the foregoing presented all links for completeness.

13.136 An inspection of those link flow changes expected in the future in the absence of Proposed Development (i.e. Table 13.11 through 13.14) shows that most flows increase into the future, even in the absence of the Proposed Development. Table 13.16 below summarises those links with significant background increases. The only significant changes (by IEMA definition detailed above) occur on Heybeck Lane, Chidswell Lane / Windsor Road, and on some parts of the A653 corridor between the M62 and Dewsbury.

Table 13.16: Background Significant Traffic Increases

Link	Link Description	2024 Without Dev. % Increase over 2019	Severance Signif.	2030 Without Dev. % Increase over 2019	Severance Signif.
L06	Heybeck La (Leeds Rd to Site Access 1)	37%	Slight	69%	Moderate
L07	Heybeck La (East of Site Access 1)	26%	Negligible	50%	Slight
L09	A653 Leeds Rd (Heybeck La to Site Access 2)	17%	Negligible	37%	Slight
L18	High St	29%	Negligible	63%	Moderate
L26	Chidswell La (Site Access 4 to Windsor Rd)	52%	Slight	137%	Substantial
L28	Windsor Rd	57%	Slight	148%	Substantial
L47	A653 Dewsbury Rd SB (South of M62 J28)	17%	Negligible	34%	Slight

Table 13.17: Significant Traffic Increases due to the Proposed Development

Link	Link Description	2024 Net With Dev. % Increase over 2019	Severance Signif.	2030 Net With Dev. % Increase over 2019	Severance Signif.
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	3%	Negligible	30%	Slight
L14	A653 Leeds Rd (Chidswell La to Owl La)	3%	Negligible	33%	Slight
L19	A653 Leeds Rd (South of High St)	2%	Negligible	33%	Slight
L21	Owl La (A653 Leeds Rd to B6128 John Ormsby VC Wy)	6%	Negligible	45%	Slight
L24	Chidswell La (A653 Leeds Rd to Site Access 4)	0%	Negligible	97%	Substantial
L60	Leeds Road	3%	Negligible	38%	Slight

13.137 The effect of the Proposed Development is considered against the expected changes in the background situation. Table 13.17 includes those links for which the net effect of the Proposed Development is significant with regard to pedestrian severance. There are no significant effects anticipated in 2024 as very little of the Proposed Development is delivered by this point. By 2030, when the Proposed Development is complete and operational, 6 links experience significant severance effects due to traffic increases, all of which are slight in magnitude, save for the westernmost part of Chidswell Lane which is indicated as 'substantial'. The majority of those links are the existing primary route of the A653 corridor, which is largely a 2x 2-lane dual carriageway. As such this already provides a substantive severance effect, regardless of any change due to increased flow. In effect, a slight increase of flows on a link which already causes substantial severance is not likely to be noticeable.

13.138 Whilst therefore the overwhelming majority of the network will experience a negligible increase in severance (if any), the part of Chidswell Lane closest to the Site will likely see an increase in traffic that classifies as 'substantial' in terms of effects on severance. It is important to frame this by noting that the percentage increase takes no account of underlying traffic volumes and that a small increase on a low trafficked road may result in a large percentage change, whilst being still a small increase in objective terms. Not taking into account any potential mitigation measures, the impact on pedestrian severance is assessed to be a **minor long-term adverse effect**.

13.139 Pedestrian delay is not expected to change substantively as a result of the Proposed Development. The existing pedestrian network is lightly used, crossings on main roads are at retained designated crossing points or will be on lightly-trafficked minor residential roads. New

crossing points will be incorporated as a part of the proposed Site accesses on Leeds Road but given the linear nature of existing built development along Leeds Road, these are unlikely to be in great demand. Overall, the effect on pedestrian delay will be **negligible**.

13.140 Fear and intimidation effects are considered as a function of the degree of hazard due to flow volumes, heavy vehicle volumes, and vehicle speeds. These are defined in absolute terms, not in terms of net Proposed Development impact. To identify those effects due to the Proposed Development, the following considers where there is a change in the category of effect due to the Proposed Development. Note that this approach is likely to over-estimate the effect of the Proposed Development as if the given measure is close to a threshold value, even a small increase could result in a category change.

Table 13.18: 2024 Fear and Intimidation Link Without Development Degrees of Hazard

Link	Link Description	2024 Without Development Traffic Flow Degree of Hazard	2024 Without Development HGV Flow Degree of Hazard	2024 Without Development Traffic Speed Degree of Hazard
L01	A653 Dewsbury Road (Hesketh La to Syke Rd)	Great	Moderate	Extreme
L02	Rein Rd	Moderate	Negligible	Extreme
L03	Syke Rd	Negligible	Negligible	Extreme
L04	A653 Leeds Rd (Syke Rd to Heybeck La)	Great	Moderate	Extreme
L05	Soothill La	Negligible	Negligible	Extreme
L06	Heybeck La (Leeds Rd to Site Access 1)	Negligible	Negligible	Extreme
L07	Heybeck La (East of Site Access 1)	Negligible	Negligible	Extreme
L08	Site Access 1	Negligible	Negligible	Extreme
L09	A653 Leeds Rd (Heybeck La to Site Access 2)	Great	Moderate	Extreme
L10	Site Access 2	Negligible	Negligible	Extreme
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	Great	Negligible	Extreme
L12	Site Access 3	Negligible	Negligible	Extreme
L13	A653 Leeds Rd (Site Access 3 to Chidswell La)	Great	Negligible	Extreme
L14	A653 Leeds Rd (Chidswell La to Owl La)	Great	Moderate	Extreme
L15	A653 Leeds Rd (Owl La to Challenge Wy)	Moderate	Negligible	Extreme
L16	B6128 Challenge Wy	Moderate	Negligible	Extreme
L17	A653 Leeds Rd (Challenge Wy to High St)	Great	Negligible	Extreme
L18	High St	Negligible	Negligible	Extreme
L19	A653 Leeds Rd (South of High St)	Moderate	Negligible	Extreme
L20	B6128 John Ormsby VC Wy	Moderate	Negligible	Extreme
L21	Owl La (A653 Leeds Rd to B6128 John Ormsby VC Wy)	Negligible	Negligible	Extreme
L22	Horace Waller VC Parade	Negligible	Negligible	Extreme
L23	B6128 Owl La (Horace Waller VC Parade to Windsor Rd)	Great	Moderate	Extreme
L24	Chidswell La (A653 Leeds Rd to Site Access 4)	Negligible	Negligible	Extreme
L25	Site Access 4	Negligible	Negligible	Extreme
L26	Chidswell La (Site Access 4 to Windsor Rd)	Negligible	Negligible	Extreme
L27	Chidswell La (East of Windsor Rd)	Negligible	Negligible	Extreme
L28	Windsor Rd	Negligible	Negligible	Extreme
L29	B6128 Owl La (Windsor Rd to Dewsbury Rams access)	Great	Negligible	Extreme
L30	Dewsbury Rams access	Negligible	Negligible	Great

Table 13.19: 2024 Fear and Intimidation Link Without Development Degrees of Hazard cont.

Link	Link Description	2024 Without Development Traffic Flow Degree of Hazard	2024 Without Development HGV Flow Degree of Hazard	2024 Without Development Traffic Speed Degree of Hazard
L31	B6128 Owl La (Dewsbury Rams access to Amberwood Ch)	Great	Negligible	Extreme
L32	Amberwood Ch	Negligible	Negligible	Extreme
L33	B6128 Owl La (East of Amberwood Ch)	Great	Moderate	Extreme
L34	Site Access over Barratt land	Negligible	Negligible	Extreme
L35	Chidswell Lane (East of Barratt land)	Negligible	Negligible	Extreme
L36	Site Access 5	Negligible	Negligible	Extreme
L37	B6128 Owl La (West of A638 rbt)	Great	Negligible	Extreme
L38	A638 Chancery Rd	Great	Moderate	Extreme
L39	B6128 Leeds Rd (East of A638 rbt)	Moderate	Negligible	Extreme
L40	A638 Wakefield Rd (North of A638 rbt)	Extreme	Great	Extreme
L41	A638 (West of M1 J40)	Extreme	Great	Extreme
L42	M1 J40 NB onslip	Moderate	Great	Extreme
L43	M1 J40 SB offslip	Moderate	Great	Extreme
L44	A638 Wakefield Rd (East of M1 J40)	Extreme	Great	Extreme
L45	M1 J40 SB onslip	Moderate	Negligible	Extreme
L46	M1 J40 NB offslip	Negligible	Moderate	Extreme
L47	A653 Dewsbury Rd SB (South of M62 J28)	Negligible	Negligible	Extreme
L48	A653 Dewsbury Rd NB (South of M62 J28)	Moderate	Negligible	Extreme
L49	A650 Tingley Common WB	Moderate	Moderate	Extreme
L50	A650 Tingley Common EB	Moderate	Negligible	Extreme
L51	M62 J28 WB onslip	Negligible	Negligible	Extreme
L52	M62 J28 EB offslip	Negligible	Negligible	Extreme
L53	A653 Dewsbury Rd NB (North of M62 J28)	Great	Moderate	Extreme
L54	A653 Dewsbury Rd SB (North of M62 J28)	Moderate	Negligible	Extreme
L55	M62 J28 EB onslip	Negligible	Negligible	Extreme
L56	M62 J28 WB offslip	Moderate	Great	Extreme
L57	A650 Bradford Rd EB	Moderate	Negligible	Extreme
L58	A650 Bradford Rd WB	Moderate	Negligible	Extreme
L59	Dewsbury Ring Road	Great	Negligible	Extreme
L60	Leeds Road	Moderate	Negligible	Extreme
L61	A638 Wakefield Rd	Great	Negligible	Extreme

13.141 Table 13.18 and 13.19 present the Fear and Intimidation Degree of Hazards for all links for 2024 in the 'Without Development' scenario. On the basis of the IMEA traffic flow thresholds, most links present at least a moderate degree of hazard, with the A653 Leeds/Dewsbury Road corridor and the A638 / B6128 corridor all showing at least a 'great' degree of hazard. These are the main roads in the area and as identified in the baseline scenario, this is to be expected and is noted to be in the absence of the Proposed Development. The A638 to the east of the Chancery Road roundabout demonstrates an 'extreme' degree of hazard but as this is a dual carriageway bypass road without pedestrian function, this is unlikely to be of practical concern. HGV flow degrees of hazard show a similar distribution to that associated with flows in general; speed-based degrees of hazard continue to be of little value as all links save for the entrance to Dewsbury Rams are classed as 'extreme' hazard.

Table 13.20: 2030 Fear and Intimidation Link Without Development Degrees of Hazard

Link	Link Description	2030 Without Development Traffic Flow Degree of Hazard	2030 Without Development HGV Flow Degree of Hazard	2030 Without Development Traffic Speed Degree of Hazard
L01	A653 Dewsbury Road (Hesketh La to Syke Rd)	Great	Moderate	Extreme
L02	Rein Rd	Moderate	Negligible	Extreme
L03	Syke Rd	Negligible	Negligible	Extreme
L04	A653 Leeds Rd (Syke Rd to Heybeck La)	Extreme	Moderate	Extreme
L05	Soothill La	Negligible	Negligible	Extreme
L06	Heybeck La (Leeds Rd to Site Access 1)	Moderate	Negligible	Extreme
L07	Heybeck La (East of Site Access 1)	Negligible	Negligible	Extreme
L08	Site Access 1	Negligible	Negligible	Extreme
L09	A653 Leeds Rd (Heybeck La to Site Access 2)	Extreme	Moderate	Extreme
L10	Site Access 2	Negligible	Negligible	Extreme
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	Great	Moderate	Extreme
L12	Site Access 3	Negligible	Negligible	Extreme
L13	A653 Leeds Rd (Site Access 3 to Chidswell La)	Great	Moderate	Extreme
L14	A653 Leeds Rd (Chidswell La to Owl La)	Great	Moderate	Extreme
L15	A653 Leeds Rd (Owl La to Challenge Wy)	Moderate	Negligible	Extreme
L16	B6128 Challenge Wy	Moderate	Negligible	Extreme
L17	A653 Leeds Rd (Challenge Wy to High St)	Great	Moderate	Extreme
L18	High St	Negligible	Negligible	Extreme
L19	A653 Leeds Rd (South of High St)	Moderate	Negligible	Extreme
L20	B6128 John Ormsby VC Wy	Moderate	Negligible	Extreme
L21	Owl La (A653 Leeds Rd to B6128 John Ormsby VC Wy)	Negligible	Negligible	Extreme
L22	Horace Waller VC Parade	Negligible	Negligible	Extreme
L23	B6128 Owl La (Horace Waller VC Parade to Windsor Rd)	Great	Moderate	Extreme
L24	Chidswell La (A653 Leeds Rd to Site Access 4)	Negligible	Negligible	Extreme
L25	Site Access 4	Negligible	Negligible	Extreme
L26	Chidswell La (Site Access 4 to Windsor Rd)	Negligible	Negligible	Extreme
L27	Chidswell La (East of Windsor Rd)	Negligible	Negligible	Extreme
L28	Windsor Rd	Negligible	Negligible	Extreme
L29	B6128 Owl La (Windsor Rd to Dewsbury Rams access)	Great	Negligible	Extreme
L30	Dewsbury Rams access	Negligible	Negligible	Great

Table 13.21: 2030 Fear and Intimidation Link Without Development Degrees of Hazard cont.

Link	Link Description	2030 Without Development Traffic Flow Degree of Hazard	2030 Without Development HGV Flow Degree of Hazard	2030 Without Development Traffic Speed Degree of Hazard
L31	B6128 Owl La (Dewsbury Rams access to Amberwood Ch)	Great	Negligible	Extreme
L32	Amberwood Ch	Negligible	Negligible	Extreme
L33	B6128 Owl La (East of Amberwood Ch)	Great	Moderate	Extreme
L34	Site Access over Barratt land	Negligible	Negligible	Extreme
L35	Chidswell Lane (East of Barratt land)	Negligible	Negligible	Extreme
L36	Site Access 5	Negligible	Negligible	Extreme
L37	B6128 Owl La (West of A638 rbt)	Great	Negligible	Extreme
L38	A638 Chancery Rd	Great	Moderate	Extreme
L39	B6128 Leeds Rd (East of A638 rbt)	Moderate	Negligible	Extreme
L40	A638 Wakefield Rd (North of A638 rbt)	Extreme	Great	Extreme
L41	A638 (West of M1 J40)	Extreme	Great	Extreme
L42	M1 J40 NB onslip	Moderate	Great	Extreme
L43	M1 J40 SB offslip	Moderate	Great	Extreme
L44	A638 Wakefield Rd (East of M1 J40)	Extreme	Great	Extreme
L45	M1 J40 SB onslip	Moderate	Negligible	Extreme
L46	M1 J40 NB offslip	Moderate	Moderate	Extreme
L47	A653 Dewsbury Rd SB (South of M62 J28)	Moderate	Negligible	Extreme
L48	A653 Dewsbury Rd NB (South of M62 J28)	Moderate	Moderate	Extreme
L49	A650 Tingley Common WB	Moderate	Moderate	Extreme
L50	A650 Tingley Common EB	Moderate	Negligible	Extreme
L51	M62 J28 WB onslip	Negligible	Negligible	Extreme
L52	M62 J28 EB offslip	Negligible	Negligible	Extreme
L53	A653 Dewsbury Rd NB (North of M62 J28)	Great	Moderate	Extreme
L54	A653 Dewsbury Rd SB (North of M62 J28)	Moderate	Negligible	Extreme
L55	M62 J28 EB onslip	Negligible	Negligible	Extreme
L56	M62 J28 WB offslip	Moderate	Great	Extreme
L57	A650 Bradford Rd EB	Moderate	Negligible	Extreme
L58	A650 Bradford Rd WB	Moderate	Negligible	Extreme
L59	Dewsbury Ring Road	Great	Negligible	Extreme
L60	Leeds Road	Moderate	Negligible	Extreme
L61	A638 Wakefield Rd	Great	Negligible	Extreme

13.142 Tables 13.20 and 13.21 show the 2030 'Without Development' Degrees of Hazard for all links based on the three Fear and Intimidation factors. The observed pattern is similar to that of 2024, save that some links have changed category with background (and committed development) flow increases. For example, that part of the A653 (Leeds Road / Dewsbury Road) between Syke Road and the location of Site Access escalates in degree of hazard due to traffic flow from 'great' to 'extreme'.

Table 13.22: 2024 Fear and Intimidation Link With Development Degrees of Hazard

Link	Link Description	2024 With Development Traffic Flow Degree of Hazard	2024 With Development HGV Flow Degree of Hazard	2024 With Development Traffic Speed Degree of Hazard
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	No net change	Moderate	No net change
L47	A653 Dewsbury Rd SB (South of M62 J28)	Moderate	No net change	No net change

Table 13.23: 2030 Fear and Intimidation Link With Development Degrees of Hazard

Link	Link Description	2030 With Development Traffic Flow Degree of Hazard	2030 With Development HGV Flow Degree of Hazard	2030 With Development Traffic Speed Degree of Hazard
L01	A653 Dewsbury Road (Hesketh La to Syke Rd)	Extreme	No net change	No net change
L04	A653 Leeds Rd (Syke Rd to Heybeck La)	No net change	Great	No net change
L05	Soothill La	Moderate	No net change	No net change
L07	Heybeck La (East of Site Access 1)	Moderate	No net change	No net change
L11	A653 Leeds Rd (Site Access 2 to Site Access 3)	Extreme	No net change	No net change
L13	A653 Leeds Rd (Site Access 3 to Chidswell La)	Extreme	No net change	No net change
L14	A653 Leeds Rd (Chidswell La to Owl La)	Extreme	No net change	No net change
L15	A653 Leeds Rd (Owl La to Challenge Wy)	Great	Moderate	No net change
L16	B6128 Challenge Wy	No net change	Moderate	No net change
L20	B6128 John Ormsby VC Wy	No net change	Moderate	No net change
L21	Owl La (A653 Leeds Rd to B6128 John Ormsby VC Wy)	Moderate	No net change	No net change
L29	B6128 Owl La (Windsor Rd to Dewsbury Rams access)	Extreme	No net change	No net change
L40	A638 Wakefield Rd (North of A638 rbt)	No net change	Extreme	No net change
L48	A653 Dewsbury Rd NB (South of M62 J28)	Great	No net change	No net change
L51	M62 J28 WB onslip	No net change	Moderate	No net change
L60	Leeds Road	Great	No net change	No net change

13.143 For brevity, only those links which demonstrate a net change in a degree of hazard rating due to the Proposed Development are presented in Table 13.22 and Table 13.23 for each of 2024 and 2030 respectively. In 2024, some minor increases of hazard are indicated for some limited parts of the A653 associated with the increase in traffic volume.

13.144 In 2030, a larger number of links are up-rated to higher degrees of hazard. With the exception of Heybeck Lane and Soothill Lane which both show moderate degree of hazard, the remaining links are all a part of the A653 Leeds Road / Dewsbury Road corridor, or the A638 / B6128 corridors which are already the existing major routes in the area. In reality, the increased degree of hazard is not likely to be practically perceptible. Consequently, though it is noted that fear and intimidation due to traffic is expected to increase in the future, with or without the Proposed Development, it is determined that the Proposed Development will have a net **negligible** effect on pedestrian fear and intimidation.

Cycling Facilities

13.145 Within the Site, existing public rights of way which can currently be used by cyclists will be retained as the Site is built-out. This will generally increase their accessibility and in some cases will involve upgrading of existing unmade routes into new paved routes. These combined with the new network of roads and incorporated cycle facilities within the Site, will represent an improvement on the current situation, though clearly much of the usage demand will be due to the Site itself. Conversely, the change in character of these routes from 'rural' to 'urban' will lead to a change of usage from 'off-road' cycling to 'utility' cycling.

13.146 Beyond the Site, no specific cycle interventions are proposed, although the new Site accesses on Leeds Road will incorporate cycle facilities to prevailing design standards and the expected increase in cycle demand will act as a catalyst for the improvement of existing cycle routes and facilities, and provision of new routes, across a wider area.

13.147 As cycle users on the Site are currently limited, the effects on any given user carries some uncertainty. The new potential for cycle routing for local and new residents is likely to outweigh a loss of off-road cycling options for leisure cyclists. It is therefore considered that the Proposed Development will have a **minor long-term beneficial effect** on cycling facilities.

Public Transport

13.148 The complete and operational Proposed Development is expected to have approximately 10% of trips undertaken by public transport, 8% by bus and 2% by train.

Table 13.24: Bus trip generation by Proposed Development

Time Period (Hour commencing)	2024 Two-way Development Bus Trip Generation	2030 Two-way Development Bus Trip Generation
07:00	9	105
08:00	17	206
09:00	9	138
10:00	4	101
11:00	7	110
12:00	8	129
13:00	8	118
14:00	6	119
15:00	8	159
16:00	15	180
17:00	14	193
18:00	4	138
Total	109	1696

13.149 Table 13.24 summarises anticipated bus trip generation. Spread over the given hour and in light of the frequency and range of routes available, effects in 2024 are likely to be negligible.

13.150 By the completion of the Proposed Development, bus trip generation is significantly higher with an expected two-way peak in the AM of 206 trips. These are anticipated to be split broadly evenly between arrivals and departures (residents leaving the Site are counterbalanced by workers arriving to the Site), but this would still require an available capacity of around 100 passengers per hour. In the absence of any change to the current routes and frequency of availability, it is unclear if there is capacity to absorb the anticipated trips in the current service.

13.151 Given the current funding environment, and the location of the Site along the Dewsbury to Leeds corridor, it is likely that bus provision (especially in peak periods) is on a predominantly commercial (i.e. not subsidised) basis. It is therefore the case that increased passenger numbers reinforce the business case for the provision of services, and, with current

frequencies being relatively low, additional capacity can be provided through an increase in bus frequency on a commercial basis, as required, over the period of delivery through 2030.

13.152 On this basis, it is considered that any potential detriment due to increased service crowding will be naturally mitigated through increased frequencies and range of service routings provided on a dynamic commercial basis. More frequent services to a wider range of destinations is a benefit to existing users and makes bus use more appealing to future users. Taking into account the identified natural mitigation, the effect on buses due to the Proposed Development is likely to be a **minor beneficial long-term effect**.

Table 13.25: Rail trip generation by Proposed Development

Time Period (Hour commencing)	2024 Two-way Development Rail Trip Generation	2030 Two-way Development Rail Trip Generation
07:00	2	26
08:00	4	51
09:00	2	34
10:00	1	25
11:00	2	27
12:00	2	32
13:00	2	29
14:00	1	29
15:00	2	39
16:00	4	44
17:00	4	47
18:00	1	34
Total	27	417

13.153 Table 13.25 summarises anticipated rail trip generation. Overall, rail trip numbers are proportionately low, peaking at 51 two-way trips in the AM peak hour by 2030. Arrivals and departure trips are generally balanced (residents leaving the Site are counterbalanced by workers arriving to the Site), so an available service capacity of around 25 passengers per hour is likely to be required by that time. Rail trips generated by the Proposed Development in 2024 are negligible.

13.154 Existing capacity constraints and train loading through Dewsbury and Batley station are unknown, though anecdotal peak hour overcrowding is reported. With 4 trains per hour in each direction at Dewsbury in the AM peak, two of which call at Batley, train loading increase could be as low as 6 people per train. It is unlikely that such an increase would be outside the range of daily variation. It should also be noted that the local rail operators are currently implementing a programme of train replacements and capacity enhancement.

13.155 On the basis of the above, rail effects are likely to be **negligible**.

Junction Capacity and Driver Delay

13.156 Junction capacity of the local road network has been assessed using standalone industry-standard traffic modelling tools, i.e. Junctions 9 or LinSig, depending on whether they are non-signalised or signalised junctions respectively.

Table 13.26: 2024 Without Development

Junction	Name of Junction	Worst Performing Arm	Maximum DoS / RFC (AM)	Maximum DoS / RFC (PM)
1	M1 Junction 40 (Flushdyke Interchange) – signal-controlled roundabout	A638	100.6%	68.0%

2	M62 Junction 28 (Tingley Interchange) – signal-controlled roundabout	M62 J28 Off-Slip	81.5%	93.1%
3	A653 Leeds Road / Heybeck Lane – signal-controlled junction	All Arms within Capacity	73.9	70.4
4	A653 Leeds Road / Chidswell Lane – priority T-junction	All Arms within Capacity	0.39	0.13
5	A653 Leeds Road / B6128 Challenge Way / B6128 John Ormsby V C Way (Shaw Cross Junction) – signal-controlled junction, both existing and KC proposed improvement		97.4	94.2
6	B6128 Owl Lane / Windsor Road – priority T-junction	Owl Lane (RT into Windsor Rd)	0.98	0.31
7	A638 Wakefield Road / A638 Chancery Road / B6128 Owl Lane / B6128 Leeds Road – priority roundabout	Wakefield Road A638	1.04	0.94
8	Chidswell Lane / Windsor Road – priority T-junction	All Arms within Capacity	0.03	0.06
9	A653 Leeds Road / Owl Lane – signal-controlled junction	All Arms within Capacity	66.8	60
10	B6128 John Ormsby V C Way / B6128 Owl Lane / Horace Waller V C Parade – priority roundabout;	All Arms within Capacity	0.86	0.59
11	A653 Leeds Road / A6209 Rein Road / A653 Dewsbury Road / Syke	All Arms within Capacity	76.8	117.9

	Road – signal-controlled junction			
12	Owl Lane / Dewsbury Rams Access – Roundabout junction	All Arms within Capacity	0.65	0.57
13	Owl Lane / Amberwood Close	All Arms within Capacity	0.54	0.17
14	Site Access 1	All Arms within Capacity	0.1	0.07
15	Site Access 4	n/a	n/a	n/a
16	Site Access 5	n/a	n/a	n/a

Table 13.27: 2024 With Development

Junction	Name of Junction	Worst Performing Arm	Maximum DoS / RFC (AM)	Maximum DoS / RFC (PM)
1	M1 Junction 40 (Flushdyke Interchange) – signal-controlled roundabout	All Arms within Capacity	81.3	77.7
2	M62 Junction 28 (Tingley Interchange) – signal-controlled roundabout	All Arms within Capacity	75.9	77.8
3	A653 Leeds Road / Heybeck Lane – signal-controlled junction	All Arms within Capacity	83.4	75.9
4	A653 Leeds Road / Chidswell Lane – priority T-junction	All Arms within Capacity	0.40	0.14
5	A653 Leeds Road / B6128 Challenge Way / B6128 John Ormsby V C Way (Shaw Cross Junction) – signal-controlled junction, both existing and KC proposed improvement		94.2	84.3
6	B6128 Owl Lane / Windsor Road – priority T-junction	AM: Owl La PM: Windsor Rd	0.98	0.31

7	A638 Wakefield Road / A638 Chancery Road / B6128 Owl Lane / B6128 Leeds Road – priority roundabout	Wakefield Road A638	1.04	0.94
8	Chidswell Lane / Windsor Road – priority T-junction	All Arms within Capacity	0.03	0.06
9	A653 Leeds Road / Owl Lane – signal-controlled junction	All Arms within Capacity	70.6	62.6
10	B6128 John Ormsby V C Way / B6128 Owl Lane / Horace Waller V C Parade – priority roundabout;	Owl La SE	0.88	0.59
11	A653 Leeds Road / A6209 Rein Road / A653 Dewsbury Road / Syke Road – signal-controlled junction		117.9	77
12	Owl Lane / Dewsbury Rams Access – Roundabout junction	All Arms within Capacity	0.66	0.58
13	Owl Lane / Amberwood Close	All Arms within Capacity	0.58	0.17
14	Site Access 1	n/a	0.1	0.07
15	Site Access 4	n/a	n/a	n/a
16	Site Access 5	n/a	n/a	n/a

Table 13.28:2030 Without Development

Junction	Name of Junction	Worst Performing Arm	Maximum DoS / RFC (AM)	Maximum DoS / RFC (PM)
1	M1 Junction 40 (Flusdyke Interchange) – signal-controlled roundabout	All Arms within Capacity	81.8	77.6
2	M62 Junction 28 (Tingley	M62 J28 Off-Slip	80.3	79.3

	Interchange) – signal-controlled roundabout			
3	A653 Leeds Road / Heybeck Lane – signal-controlled junction	All Arms within Capacity	77.8	77.1
4	A653 Leeds Road / Chidswell Lane – priority T-junction	All Arms within Capacity	0.38	0.13
5	A653 Leeds Road / B6128 Challenge Way / B6128 John Ormsby V C Way (Shaw Cross Junction) – signal-controlled junction, both existing and KC proposed improvement		96.1	90.6
6	B6128 Owl Lane / Windsor Road – priority T-junction	Owl Lane (RT into Windsor Rd)	1.01	0.31
7	A638 Wakefield Road / A638 Chancery Road / B6128 Owl Lane / B6128 Leeds Road – priority roundabout	Wakefield Road A638	1.01	0.89
8	Chidswell Lane / Windsor Road – priority T-junction	All Arms within Capacity	0.03	0.06
9	A653 Leeds Road / Owl Lane – signal-controlled junction	All Arms within Capacity	79.5	62.5
10	B6128 John Ormsby V C Way / B6128 Owl Lane / Horace Waller V C Parade – priority roundabout;	Owl Lane (SE)	0.9	0.59
11	A653 Leeds Road / A6209 Rein Road / A653 Dewsbury Road / Syke Road – signal-		119.6	92.7

	controlled junction			
12	Owl Lane / Dewsbury Rams Access – Roundabout junction	All Arms within Capacity	0.68	0.58
13	Owl Lane / Amberwood Close	All Arms within Capacity	0.72	0.17
14	Site Access 1	All Arms within Capacity	0.19	0.12
15	Site Access 4	n/a	n/a	n/a
16	Site Access 5	n/a	n/a	n/a

Table 13.29: 2030 With Development

Junction	Name of Junction	Worst Performing Arm	Maximum DoS / RFC (AM)	Maximum DoS / RFC (PM)
1	M1 Junction 40 (Flushdyke Interchange) – signal-controlled roundabout	A638	91.2	82.6
2	M62 Junction 28 (Tingley Interchange) – signal-controlled roundabout	M62 J28 Off-Slip	81.1	86.4
3	A653 Leeds Road / Heybeck Lane – signal-controlled junction		118.2	133.5
4	A653 Leeds Road / Chidswell Lane – priority T-junction	Chidswell Lane	1.13	0.54
5	A653 Leeds Road / B6128 Challenge Way / B6128 John Ormsby V C Way (Shaw Cross Junction) – signal-controlled junction, both existing and KC proposed improvement		114.3	116.3
6	B6128 Owl Lane / Windsor Road – priority T-junction	Owl Lane (RT into Windsor Rd)	1.30	1.06

7	A638 Wakefield Road / A638 Chancery Road / B6128 Owl Lane / B6128 Leeds Road – priority roundabout	Wakefield Road A638	1.06	1.09
8	Chidswell Lane / Windsor Road – priority T-junction	All Arms within Capacity	0.03	0.06
9	A653 Leeds Road / Owl Lane – signal-controlled junction		105.0	103.7
10	B6128 John Ormsby V C Way / B6128 Owl Lane / Horace Waller V C Parade – priority roundabout;	Owl Lane (SE)	1.17	0.84
11	A653 Leeds Road / A6209 Rein Road / A653 Dewsbury Road / Syke Road – signal-controlled junction		141.2	100.3
12	Owl Lane / Dewsbury Rams Access – Roundabout junction	Owl Lane (W)	0.82	0.85
13	Owl Lane / Amberwood Close	Amberwood Chase	Inf	0.75
14	Site Access 1	All Arms within Capacity	0.19	0.12
15	Site Access 4	All Arms within Capacity	0.74	0.38
16	Site Access 5	n/a	n/a	n/a

13.157 Tables 13.26 through 13.29 summarise key statistics for the junctions within the study area. For a full and comprehensive assessment, the reader is directed to the TA at Appendix 13.1.

13.158 For each junction, a modelling exercise was undertaken using surveyed (i.e. baseline) traffic data to produce models to replicate the current situation in 2019 (where relevant). Then, in the future interim year of 2024 and the future year 2030 when the Proposed Development is expected to be complete and operational, those models are used to test scenarios both with and without the Proposed Development and to establish the net impact of the Proposed Development on the junctions, both in terms of operation and of ultimate capacity.

13.159 A number of the junctions are identified as having operational and/or capacity issues in future years as a result of the background growth of traffic (inclusive of committed

developments). Background growth in the area is predominantly due to Local Plan growth in Kirklees, but further reinforced by similar high growth plans for adjacent local authorities (such as Leeds and Wakefield) and wider regional and national growth expectations.

13.160 In light of this, when Proposed Development traffic is added to junctions already at or over capacity, existing or anticipated issues are exacerbated, and as an overall result traffic levels at a number of the considered junctions are taken beyond the point of capacity/operability that is usually considered acceptable. If highway capacity is to be expanded to cater for forecast flows, some mitigation may be necessary. In the absence of such mitigation, and bearing in mind the context of the current inability of the network to accommodate future growth regardless of the Proposed Development, the Proposed Development itself would be expected to have an additional overall **minor adverse long-term effect**.

Road Traffic Collision and Safety Data

13.161 Given the delivery of the Site is proposed on land which is currently undeveloped, any new roads provide potential for accidents to occur where that was not possible previously. New roads within the Site are to be designed in line with prevailing standards and are generally focussed on property access, meaning that speeds will be low and the severity of any potential accidents likely to be generally less severe. The practical effect for existing people in the area is likely to be negligible.

13.162 Outside of the Site, no specific interventions are proposed to deliver the Proposed Development save that Site accesses will be provided to prevailing design standards. The effect of such changes is likely to be negligible.

13.163 Overall, road safety effects due to the Proposed Development are likely to be **negligible**.

Residual Effects

Construction Phase

13.164 The assessment above indicates that a minor medium-term adverse effect will be expected due to the process of construction.

13.165 As the detail of the Site emerges in the future, and as contractor(s) are appointed, the processes and methodology required will emerge. It would be expected that construction traffic management would form a key part of that process and this would provide the opportunity to minimise negative effects where possible. This would be secured by planning condition and through contractual condition with the appointed delivery contractor(s) and be delivered in the form of a Construction Management Plan (CMP). A CMP could include measures such as avoiding delivery trips in the peak traffic hours and defined routes for contractors so as to avoid the most sensitive receptors/roads.

13.166 Despite that, it is however likely that the effects of the construction process could still be noticeable for those in close proximity to the Site and as such it is expected that the residual effect of construction would remain as a **minor adverse medium-term effect**. It should be noted that this would be expected to be much more limited in scope than would otherwise be the case without mitigation.

Operational Phase

Pedestrian Movement and Capacity

13.167 As the above assessment indicates a long-term beneficial minor effect on pedestrian movement and capacity, no mitigation is required and therefore a residual **long-term minor beneficial effect** is expected.

Pedestrian Severance, Delay, Fear and Intimidation

13.168 The forgoing assessment determined that pedestrian severance was expected to result in a localised minor long-term adverse effect, in particular on Chidswell Lane. Chidswell Lane is the location of Site Access 4 and this access junction will be delivered to prevailing design standards (such as the Kirklees Highway Design Guide SPD and the Manual for Streets). The design of a new junction and associated works provides the opportunity to improve crossing facilities on Chidswell Lane, reducing severance and improving the quality of the pedestrian experience whilst improving north-south connectivity.

13.169 Whilst the specific details are a matter for further/detailed design, pedestrian crossing facilities incorporated within the design will mitigate the increased perception of severance on Chidswell Lane. With such improvements, it would be expected that the residual effect of the Proposed Development could be reduced to be **negligible**.

13.170 The assessment in this chapter determined that the effect of the Proposed Development on pedestrian delay was likely to be **negligible**, and that the effect on fear and intimidation would be **negligible** overall.

Cycling Facilities

13.171 As the above assessment indicates a long-term beneficial minor effect on cycle facilities, no mitigation is required and therefore a residual **long-term minor beneficial effect** is expected.

Public Transport

13.172 As the above assessment indicates a long-term beneficial minor effect on bus services, no additional mitigation is required and therefore a residual **long-term minor beneficial effect** is expected.

13.173 With regard to rail services, the effect identified above is negligible. On this basis, no mitigation is required and the residual effect is also **negligible**.

Junction Capacity and Driver Delay

13.174 The detailed highway modelling undertaken through the design process, presented in detail in the TA (Appendix 13.1) and summarised above, indicates a long-term moderate adverse effect due to the Proposed Development and within the context of increased pressure on the local and wider network as a result of background and committed growth.

13.175 The modelling outputs show that the Proposed Development will create increased levels of traffic at junctions surrounding the Site. Appropriate contributions to mitigation measures are a matter of ongoing discussion between the Applicant and KC to ensure that Proposed Development traffic will be accommodated where appropriate and otherwise managed, within the context of the high levels of growth expected in the area.

13.176 Once the agreed mitigation is in place, the effect of the Proposed Development will be reduced however it is unlikely, given the current funding and policy environment, that full provision for all future traffic flows will be made. To do so would be environmentally undesirable and would encourage more traffic (induced demand). The residual effect is therefore determined to be a **long-term minor adverse effect**.

Road Traffic Collision and Safety Data

13.177 The assessment concluded a negligible effect on road safety. Consequently, no mitigation is required and the residual effect is **negligible**.

Summary of Mitigation and Residual Effects

13.178 Table 13.30 contains a summary of the likely significant effects of the Proposed Development. Those effects which are negligible are excluded for brevity.

Table 13.30 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
<i>Construction Phase</i>			
Construction traffic: Additional traffic due to construction	Road users, Local residents	Construction Management Plan	Minor medium-term adverse
<i>Operational Phase</i>			
Pedestrian movement and capacity: Upgrade of existing PROW network	Pedestrians	N/A	Minor long-term beneficial
Pedestrian Severance: Additional vehicle traffic	Pedestrians	Improved crossing on Chidswell Lane as a part of Site Access 4	Negligible
Cycling Facilities: New cycle routing potential and improved PROW network accessibility	Cyclists	N/A	Minor long-term beneficial
Public Transport: Bus network passenger uplift	Bus passengers	N/A	Minor long-term beneficial
Junction Capacity and Driver Delay	Road users	Contributions to local junction improvements through KC	Minor long-term adverse

Summary

13.179 This Chapter has set out the assessment undertaken to determine residual effects of the Proposed Development at the Site in the context of transport and access. Further technical details to the information provided within this Chapter can be found in the TA Report included in Appendix 13.1.

13.180 This Chapter has been prepared by Pell Frischmann. Pell Frischmann is fully conversant with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 and best practice guidance including the Design Manual for Roads and Bridges (DMRB) and the Department for Transport's WebTAG Transport Analysis Guidance. Pell Frischmann has international experience working to World Bank sectoral guidelines and International EIA Standards. The team is professionally qualified and experienced in transport planning, and maintains training and competence to the highest level.

13.181 Kirklees Local Plan was the subject of an Examination in Public (EIP) by a Government-appointed Inspector in February 2018 who considered the evidence presented by KC to support the Local Plan. To support the allocation of the Site in this process, an Interim Transport Assessment was produced in August 2016, together with other supplementary information, to inform KC Highways officers and the Government-appointed Inspector of the potential transport and highways effects of a strategic masterplan development at the Site. Data produced at that time also fed into the wider highway modelling activities undertaken by KC to support the Local Plan.

13.182 Processes and methodologies herein were informed by that 2016 Interim Transport Assessment, but have since developed through a scoping process which was undertaken through 2018 and 2019 with KC, LCC, WC, and HE to establish the technical basis for the TA

(and Framework Travel Plan) to support this planning application. This Chapter has therefore been produced in accordance with the formal Environmental Impact Assessment (EIA) screening Responses issued by KC and the relevant scoping opinions of those other stakeholders. This scoping process also included regular meetings with KC and further meetings with HE and others identified above.

13.183 These assessments were used to inform the methodology and allowed for a robust assessment of the effects the Proposed Development would have on the Site and surrounding area.

13.184 The methodology detailed above was used to inform the baseline conditions. The baseline conditions provide information on the current conditions at the Site regarding transport and access. This allows the net effects of the Proposed Development to be determined.

13.185 To mitigate the adverse effects identified in the likely significant effects section, relevant mitigation measures have been proposed. Adverse effects are anticipated to occur during the construction phase due to the addition of construction traffic to the local roads. Mitigation includes the requirement for the appointed delivery contractor(s) to produce a Construction Management Plan which will include measures to manage the effect of construction traffic (and other non-transport effects) on the local area and to minimise the scale and extent of those adverse effects which are unavoidable.

13.186 A minor long-term adverse effect of the complete and operational Proposed Development is expected on the road network due to increased traffic levels, with the effect being minimised or addressed through junction improvements made by KC and to which the Applicant will contribute towards.

13.187 The remaining residual effects are all beneficial and support the Applicant's intent that the Site and Proposed Development makes a positive contribution to the local area and provides a desirable place to live and work in the future.

13.188 As part of the Transport Assessment, a Framework Travel Plan (FTP) has been prepared to encourage residents, employees and visitors of the Proposed Development to travel by sustainable modes as opposed to the private car. This FTP will provide a package of measures aimed at promoting sustainable travel and reducing car reliance among residents and visitors. The FTP targets a 5% reduction in single occupancy vehicles, that would reduce the effect on operational traffic flows, driver delay and junction capacity. The implementation of the FTP, whilst not proposed as mitigation above, will have a positive effect on the local area (and within the Proposed Development) by reducing new vehicle volumes, and contributing to the use of sustainable and active travel in the local area following completion of the Proposed Development.

13.189 The overall residual effects of the Proposed Development are considered with regard to the likely significant effects and proposed mitigation measures. Whilst some effects may have implications for transport, the mitigation measures proposed ensure that these effects are managed. The majority of effects as a result of the scheme are anticipated to be negligible or beneficial for transport and access, with the exception of construction traffic, which is anticipated to have a limited effect during the period of construction.

14 Ecology

Introduction

- 14.1 This Chapter of the ES assesses the likely significant effects of the Proposed Development with respect to Ecology. This chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the Site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 14.2 The assessment has been carried out by Senior Ecologist, Christopher Shaw BSc (Hons) (Biology, University of Leeds), MCIEEM. Chris has over 10 years' professional experience within Environmental Consultancy and has been responsible for the production of the Ecology chapter for numerous large-scale Environmental Impact Assessments UK-wide.

Scope of the Assessment

- 14.3 The key ecological issues which this chapter addresses are the potential effects of the Proposed Development upon any statutory and non-statutory designated nature conservation sites, habitats and species of conservation importance, areas of valuable semi-natural habitat and Red Listed, Rare and Legally Protected Species, which occur on Site and within the Ecological Zone of Influence (EZOI)⁵⁹. Figure 14.1 on the next page highlights the Site boundary and EZOI.
- 14.4 It also considers the need to avoid, mitigate and compensate potential impacts and sets out how best to maximise potentially positive effects. The structure of this chapter reflects the need to consider the various ecological resources relevant to the Site and then assesses the impacts of the development proposals in relation to each feature.

Ecological Zone of Influence (EZOI)

- 14.5 The influence of the Site's development will be felt differentially dependant on the habitat and faunal groups present on Site. In this instance, the EZOI is considered to encompass the following ecological features:
- Dum Wood and Dogloitch Wood
 - Downstream riparian corridors
 - Kirklees Wildlife Habitat Network (KWHN)
- 14.6 The extent of the EZOI is shown in Figure 14.1 overleaf.

⁵⁹ The EZOI is the area over which ecological features may be subject to significant effects as a result of the proposed development and associated activities. This is obviously a difficult and inevitably imprecise exercise, dependant on the nature of the development and the ecological, geographical and sociological context of the local area.

Figure 14.1 Site boundary and EZoI



Legislative and Policy Context

National Planning Policy

14.7 The National Planning Policy Framework (NPPF) (as last amended July 2019) (Ref. 1) sets out the Government's national policies and aspirations in relation to planning in England.

NPPF (Section 15): Conserving and enhancing the natural environment:

14.8 The objectives of NPPF (Section 15, para. 170 - 177) guide the planning process in the following directions relevant to this assessment:

- Contributing to, and enhancing the natural and local environment by:
 - Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils,
 - Recognising the wider benefits from natural capital and ecosystem services,
 - Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures,

- Plans should take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.
- To protect and enhance biodiversity, plans should:
 - Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
 - promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.
- When determining planning applications, local planning authorities should apply the following principles:
 - 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; and
 - 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 reasons⁵⁸ and a suitable compensation strategy exists.
- The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

Local Planning Policy

14.9 The following policy from the Kirklees Local Plan Strategy and Policies Adopted February 2019 (Ref. 2), are of relevance to the proposals at the Site:

Policy PLP 30 - Biodiversity & Geodiversity

14.10 The Council will seek to protect and enhance the biodiversity and geodiversity of Kirklees, including the range of international, national and locally designated wildlife and geological sites, Habitats and Species of Principal Importance and the Kirklees Wildlife Habitat Network.

Statutory Designated

14.11 Statutory designated sites, including the South Pennine Moors Special Protection Area (SPA) and Special Area for Conservation (SAC) and Sites of Special Scientific Interest (SSSI), are already highly protected through existing laws and legislation. In accordance with legislation, the Council will seek to ensure that harmful impacts to these areas as a result of development proposals are avoided.

14.12 Development proposed within or outside a designated Site of Special Scientific Interest, likely to have an adverse effect on the site's special nature conservation features, will not normally be permitted. Exceptionally, development will be allowed where the benefits of the development

clearly outweigh the impacts on the site's special conservation features and measures are provided to mitigate harmful impacts.

Local Designated Sites & Important Local Ecological Features

14.13 Proposals having a direct or indirect adverse effect on a Local Wildlife Site or Local Geological Site, Ancient Woodland, Veteran Tree or other important tree, will not be permitted unless the development can be shown to be of an overriding public interest and there is no alternative means to deliver the proposal. In all cases, full compensatory measures would be required and secured in the long term.

Habitats and Species of Principal Importance

14.14 Proposals will be required to protect Habitats and Species of Principal Importance unless the benefits of the development clearly outweigh the importance of the biodiversity interest, in which case long term compensatory measures will need to be secured.

Biodiversity and Development

14.15 Development proposals will be required to:

- (i) result in no significant loss or harm to biodiversity in Kirklees through avoidance, adequate mitigation or, as a last resort, compensatory measures secured through the establishment of a legally binding agreement;
- (ii) minimise impact on biodiversity and provide net biodiversity gains through good design by incorporating biodiversity enhancements and habitat creation where opportunities exist;
- (iii) safeguard and enhance the function and connectivity of the Kirklees Wildlife Habitat Network at a local and wider landscape-scale unless the loss of the site and its functional role within the network can be fully maintained or compensated for in the long term;
- (iv) establish additional ecological links to the Kirklees Wildlife Habitat Network where opportunities exist; and
- (v) incorporate biodiversity enhancement measures to reflect the priority habitats and species identified for the relevant Kirklees Biodiversity Opportunity Zone.

Policy PLP 31 - Strategic Green Infrastructure Network

14.16 Within the Strategic Green Infrastructure Network identified on the Policies Map, priority will be given to safeguarding and enhancing green infrastructure networks, green infrastructure assets and the range of functions they provide.

14.17 Development proposals within and adjacent to the Strategic Green Infrastructure Network should ensure:-

- (i) the function and connectivity of green infrastructure networks and assets are retained or replaced;
- (ii) new or enhanced green infrastructure is designed and integrated into the development scheme where appropriate, including natural greenspace, woodland and street trees;
- (iii) the scheme integrates into existing and proposed cycling and walking routes, particularly the Core Walking and Cycling Network, by providing new connecting links where opportunities exist;

- (iv) the protection and enhancement of biodiversity and ecological links, particularly within and connecting to the Kirklees Wildlife Habitat Network.

14.18 The Council will support proposals for the creation of new or enhanced green infrastructure provided these do not conflict with other Local Plan policies.

Policy PLP 33 - Trees

14.19 The Council will not grant planning permission for developments which directly or indirectly threaten trees or woodlands of significant amenity.

14.20 Proposals should normally retain any valuable or important trees where they make a contribution to public amenity, the distinctiveness of a specific location or contribute to the environment, including the Wildlife Habitat Network and green infrastructure networks.

14.21 Proposals will need to comply with relevant national standards regarding the protection of trees in relation to design, demolition and construction. Where tree loss is deemed to be acceptable, developers will be required to submit a detailed mitigation scheme.

The Conservation of Habitats and Species Regulations 2017 (post withdrawal agreement)

14.22 This legislation amends the Conservation (Natural Habitats etc) Regulations, 1994 (Ref. 3) which were produced with the aim of implementing the EC Habitats Directive (92/43/EEC). This Directive draws together previous European conservation legislation and conventions, such as the Bern Convention, 1982. The Directive aims to give Europe-wide protection to certain rare and threatened habitats on land and at sea. It builds on legislation already established under the Birds Directive of 1979, and aims to establish a series of protected sites known as The Natura 2000 series. These sites are intended to protect the unique and special wildlife of Europe and to preserve it for future generations. In Britain these Natura 2000 sites include those areas designated as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The Habitats Directive is implemented in the UK through the Conservation (Natural Habitats etc) Regulations, 1994.

The Wildlife and Countryside Act, 1981 (as amended)

14.23 This Act (Ref. 4) is the primary legislation for nature conservation in England and Wales. It confers varying degrees of protection on selected species according to their conservation status, ranging from making it an offence to take a species from the wild for profit, to full protection of a species and its habitat. Species are added or removed from the legislation from time to time, as their conservation status changes. The Act also gives guidance and instruction on statutory sites, such as Sites of Special Scientific Interest (SSSIs). Licences exempting specific works can be granted by Natural England (NE). Such licences are only granted once a full assessment has been made and an appropriate, sustainable mitigation package devised.

The Countryside and Rights of Way Act, 2000

14.24 As well as providing measures to improve countryside access for walkers, ramblers and horse riders, this Act (Ref. 5) also strengthens the protection of species and designated sites made in the Wildlife and Countryside Act. This Act also encourages the promotion of nature conservation and biodiversity issues.

The Natural Environment and Rural Communities Act 2006

14.25 Aimed primarily at protection and regeneration of rural communities this Act (Ref. 6) also aims to strengthen provisions on the protection of wildlife and habitats and mainstream biodiversity considerations into public policy and decision making. It contains provisions to improve

protection for certain species, and designated sites as well as defining the powers and responsibilities of Natural England.

The Local Biodiversity Action Plan (LBAP)

14.26 The Local Biodiversity Action Plan (LBAP) is the 'Kirklees Biodiversity Action Plan' (Ref. 7), the following Priority Habitats and Species are listed on the plan:

Table 14.1 – Kirklees BAP Priority Habitats and Species

Habitats	Species
Semi-natural pasture	Floating water plantain
Lowland and upland meadows	Great-crested newt
Lowland dry acid grassland	Marsh helleborine
Blanket bog	Northern wood ant
Upland heathland	Twite
Upland flushes	Water vole
Lowland heathland	White-clawed crayfish
Upland oak woodland	
Lowland deciduous and other woodland	
Upland mixed ashwoods	
Wet woodland	
Arable field margins	
Hedgerows	
Rivers, riverine corridors and associated habitats	
Reedbeds	
Scrub and habitat mosaics on previously developed land	

Assessment Methodology and Significance Criteria

Assessment Methodology

14.27 The extent of the survey area constitutes the land within the entire planning boundary defined in Figure 14.1. Where possible or relevant, this was extended into adjacent habitat to provide context to the Site.

14.28 A brief summary of each field survey undertaken is provided below. Detailed descriptions of survey methodologies, including the names and qualifications of surveyors, exact date(s) of surveys, extent of the study area, weather conditions at time of survey(s) and time of day (if relevant) - are provided in the Technical Appendices.

Extended Phase 1 Survey

14.29 The initial walkover survey was undertaken on 20th July 2016 and followed a Phase 1 Habitat Survey methodology (JNCC, 2010) (Ref. 8), which was extended to assess faunal potential. This involves walking the Site, mapping and describing different habitats; and looking for evidence of fauna and faunal habitat. This modified approach to the Phase 1 survey is in accordance with the approach recommended for scoping ecological assessments by the Guidelines for Preliminary Ecological Appraisal (CIEEM 2016) (Ref. 9).

Desk Study

- 14.30 The desk study involved contact with the key local data holders – this being West Yorkshire Ecology (WYE) - at the scoping stage during 2012, to look for records of protected or otherwise notable species and local designated sites. A search on the MAGIC website (Ref. 10) has also been carried out to identify all statutory designations within a 2 - 10 kilometre radius of the Site boundary. This is a valuable tool for assessing the relationship of a potential development site with nearby important habitats.
- 14.31 As part of the desk study, aerial photographs published on commonly used websites were studied to place the Site in its wider context and to look for ecological features that would not be evident on the ground during the walkover survey. This approach can be very useful in determining if a site is potentially a key part of a wider wildlife corridor or an important node of habitat in an otherwise ecologically poor landscape. It can also identify potentially important faunal habitat (in particular ponds) which could have a bearing on the ecology of the Site.
- 14.32 Ponds may sometimes not be apparent on aerial photographs so close detailed maps were reviewed that identify all ponds, issues and drains. Promap Street + scale maps (Ref. 11) are used for this purpose. Findings from this study are incorporated within the site survey description in the baseline conditions section of this chapter.

HSI Assessment

- 14.33 Information on four off-site ponds, situated within a 500m radius of the Site Survey Area and not separated by barriers, was collected on 9th March 2018. This information was then used to calculate each ponds Habitat Suitability Index (HSI) score. Based on an index produced by Oldham et al (2000) (Ref. 12), the HSI is recognised by Natural England as a useful tool in evaluating the potential of ponds to support great crested newt (GCN) and therefore the likelihood of offences in relation to this species.

Breeding Birds

- 14.34 Three breeding bird survey visits were made on the 18th April, 21st May and 22nd June 2018. Amended visit Common Birds Census (CBC) territory mapping methodology (Ref. 13) was used to record breeding bird activity on site. Registrations of all bird species observed within the site red-line boundary or overflying the site and heard singing and/or calling were entered onto field survey maps using standard British Trust for Ornithology (BTO) species and activity codes. The site was walked to less than 100m of every point within the red-line boundary and the survey route was reversed accordingly on each visit to alleviate recording bias. Bird registrations within peripheral areas of habitat were also incorporated.

Barn Owl Scoping

- 14.35 Survey was undertaken on 26th March 2018 and followed the methodology outlined by Gilbert, Gibbons & Evans (1998) (Ref. 14), Hardey et al. (2009) (Ref. 15), Shawyer (2011) (Ref. 16) and the Barn Owl Trust (2012) (Ref. 17).
- 14.36 An intensive walkover survey of the site was made to systematically search, map and assess potential Barn Owl breeding and roosting sites within the red-line boundary. The walkover was undertaken while trees were still leafless to enable trees with suspected cavities to be located, assessed and checked.

Badger Survey

- 14.37 A walkover survey was undertaken on 9th March 2018 by an experienced ecologist with significant experience of badger survey and mitigation. The Site was thoroughly searched for

evidence of badger activity by looking for setts, latrines or dung pits, snuffle holes and evidence of foraging, mammal paths, footprints in areas of soft mud and hairs caught on fencing.

Bat Survey

14.38 Thorough daytime inspections of trees and buildings were made in March 2018 and August 2018, respectively. Survey looked for evidence of bats and assess suitability for roosting. Bat roosting potential of the trees was classified according to the criteria set out in the Bat Conservation Trust Good Practice Guidelines (BCT 2016) (Ref. 18).

14.39 All buildings with roost suitability were subject to emergence survey between 14th – 16th August 2018, in accordance with the Bat Conservation Trust, Survey Good Practice Guidelines (2016). The surveyors, using heterodyne detectors, were in place at least half an hour before dusk and left once all species of bat would be expected to have left a roost and patterns of activity within the site had been appraised.

14.40 Monthly bat activity transects were carried out between April and September 2018 in accordance with the Bat Surveys for Professional Ecologists – Good Practice Guidelines, Bat Conservation Trust (2016). To supplement data collected during transects, static monitoring devices (Wildlife Acoustic SM4+) were deployed in strategic locations around the site prior to the start of each survey. These were then left to run for a minimum of 5 nights.

Water vole Survey

14.41 An early season visit was carried out on the 20th April 2018, with a late season visit on 6th September 2018. Both were undertaken in suitable weather conditions and led by an experienced field worker. Water vole survey followed Dean et al. (2016) (Ref. 19) and assessed evidence of water vole activity.

Reptile Survey

14.42 Reference was made to The Herpetofauna Worker's Manual (Gent and Gibson, 2003) (Ref. 20) for the survey methodology with seven official reptile survey visits being carried out between 29th March 2018 and 3rd October 2018.

Hedgerow Survey

14.43 Survey was carried out on the 6th June 2018 and followed the methodology set out in the Hedgerow Regulations 1997 and the Hedgerow Survey Handbook (DEFRA, 2007) (Ref. 21).

Significance Criteria

14.44 An Ecological Impact Assessment (EcIA) should include potential impacts on each ecological feature determined as 'important' from all phases of the project, e.g. construction, operation and decommissioning. It should consider direct, indirect, secondary and cumulative impacts and whether the impacts and their effects are short, medium, long-term, permanent, temporary, reversible, irreversible, positive and/or negative. The significant effects must be assessed in the context of the predicted baseline conditions within the zone(s) of influence during the lifetime of the development.

14.45 'Significance' is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of EcIA, 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general.

14.46 Significant effects should be qualified with reference to an appropriate geographic scale. The following frame of reference should be used, or adapted to suit local circumstances:

- (i) International and European
- (ii) National
- (iii) Regional
- (iv) District
- (v) Local

14.47 Significance will be assigned based on the geographical scale at which an impact to an ecological important feature could be felt.

14.48 There could be any number of possible impacts on important ecological features arising from a development. However, it is only necessary to describe in detail the impacts that are likely to be significant. Impacts that are either unlikely to occur, or if they did occur are unlikely to be significant, can be scoped out. For transparency, justification for scoping out any ecological impact should be provided.

14.49 When describing ecological impacts, reference should be made to the following characteristics. The assessment only needs to describe those characteristics relevant to understanding the ecological effect and determining the significance.

- positive or negative;
 - Positive (beneficial) impact – a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. Positive impacts may also include halting or slowing an existing decline in the quality of the environment.
 - Negative (adverse) impact – a change which reduces the quality of the environment e.g. destruction of habitat, removal
- extent; the spatial or geographical area over which the impact/effect may occur.
- magnitude; the size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- duration; defined in relation to ecological characteristics (such as a species' lifecycle) as well as human timeframes. Effects may be described as short, medium or long-term and permanent or temporary. Short, medium, long-term and temporary will need to be defined in months/years.
- timing and frequency; the number of times an activity occurs will influence the resulting effect. The timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons e.g. bird nesting season.
- reversibility. an irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.

Continuity with other Chapters

14.50 Other disciplines within the ES classify the effect of the development (both beneficial and adverse impact) using the following measures. For continuity, the EcIA will follow this terminology.

Table 14.2 – Methodology for Determining Impact Significance

Significance of Impact	Criteria for assessing impact
Major	Total loss or major/substantial alteration to key element/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.

14.51 Any impact that is above the negligible threshold (Minor, Moderate and High), will be considered significant.

Limitations and Assumptions

14.52 All surveys were undertaken during optimal survey conditions and time of year and were not constrained. No assumptions have been made.

Baseline Conditions

14.53 To provide information on the Site's baseline ecological value, the following studies have been carried out; with the relevant reports produced being:

- Extended Phase 1 Habitat Survey. July 2018. WYG Report Ref: A054074
- HSI Assessment. May 2018. Report Ref: R-3280-01.
- Barn Owl Scoping Assessment. April 2018. Report Ref: R-3280-02.
- Ornithological Summary (Breeding Birds). October 2018. Report Ref: R-3280-03.
- Badger Assessment. April 2018. Report Ref: R-3280-04.
- Bat Roost Suitability Assessment (Trees). April 2018. Report Ref: R-3280-05.
- Bat Activity Survey. November 2018. Report Ref: R-3280-06.
- Water vole Assessment & Report. Sept. 2018. Report Ref: R-3280-07.
- Reptile Survey. October 2018. Report Ref: R-3280-08.
- Hedgerow Assessment. July 2018. Report Ref: R-3280-09.
- Bat Roost Suitability Assessment (Houses). August 2018. Report Ref: R-3280-10.
- Bat Emergence Survey. August 2018. Report Ref: R-3280-11.

Designated Sites

Statutory

14.54 No internationally designated sites were identified within 20km of the site boundary or downstream of the becks.

Non-Statutory

14.55 Ten locally designated sites lie within 2km of the Site. These include a mix of Local Wildlife Sites (LWS), Leeds Nature Areas (LNA) and Sites of Wildlife Significance (SWS):

Table 14.3 – Summary of Non-Statutory Designations

Non-Statutory Site	Designation(s)	Location	Notes
Dogloitch Wood	LWS, SWS	20m east	Woodland with high bluebell density cover
Dum Wood	LWS, SWS	20m east	Woodland with high bluebell density cover
Haigh Hall Spring Wood North	LWS, LNA	880m east	Woodland with high bluebell density cover
Haigh Hall Spring Wood South	LWS, LNA	880m east	Woodland with high bluebell density cover
Haigh Wood	LWS, LNA	850m north east	Woodland with high bluebell density cover
Scargill Wood	LWS, SWS	70m north	Ancient and semi-natural woodland
Soothill Wood	LWS	230m north west	Ancient and semi-natural woodland
Ardsley Reservoir	LNA	1.5km north east	-
Judes Pond	LNA	1.2km north east	-
Soothill Brick Works	SWS	220m north west	-

14.56 Of the ten non-statutory designated sites listed above, only the two closest (Dum Wood and Dogloitch Wood) have the potential to be adversely impacted upon by the Proposed Development. These two sites are of District Importance and will need to be considered as part of this assessment.

Kirklees Wildlife Habitat Network

14.57 A small area of the Site, including a single length of hedgerow and small section of wooded watercourse positioned towards the centre of the eastern boundary, is mapped as being within the Kirklees Wildlife Habitat Network (KWHN). The KWHN is covered by Policy PLP 31 – Strategic Green Infrastructure Network, in the Kirklees Strategic Local Plan. This policy requires development protect and, where possible, enhance the biodiversity and ecological linkage of habitat within and connecting to the KWHN.

14.58 Dum Wood and Dogloitch Wood, along with downstream sections of the wooded watercourse are also covered by the KWHN; this can be seen in Figure 14.2 below.

Figure 14.2 Approximate extent of the KWHN within proximity of the Site



Habitats

14.59 The following habitats are identified within the Site and on its immediate boundaries. They are described in turn below:

Arable

14.60 Arable land is the dominant habitat across the Site. The field boundary margins range in width from <1m to 4m and comprise tall grasses and tall ruderal vegetation.

14.61 This habitat, although extensive, is of low conservation significance and for the purpose of this assessment is considered to be of no more than Site level importance.

Poor Semi-Improved Neutral Grassland

14.62 There is an enclosed patch of semi-improved neutral grassland within the centre of the Site. The grassland is set on a slight elevation sloping down towards a tributary of the Hey Beck that runs through the Site. A small section of this area is utilised as a temporary storage for manure.

14.63 This habitat is of low conservation significance and for the purpose of this assessment is considered to be of no more than Site level importance.

Scrub

14.64 Small areas of scrub have established along the banks of drainage ditches to the north, and within areas of previously disturbed land that has been left unmanaged. This habitat is considered to be of Site level importance.

Broadleaved Woodland

14.65 Broadleaved woodland forms a number of internal and external boundary features on and immediately adjacent to the site. A 90m stretch of broadleaved woodland forms a partition in the northwest of the site between parcels of arable land. Internally in the southwest of the site, a 323m length of broadleaved woodland (plantation) forms a boundary feature between the site and residential properties to the west.

14.66 This habitat, being largely planted, small in extent and poorly connected, is considered to be of relatively low conservation significance at present and for the purpose of this assessment is considered to be of Site level importance only.

Hedgerows

14.67 Hedgerows are present across the site marking many of the field and site boundaries. The hedgerows onsite are predominantly intact and species-poor hedgerows, with a few being defunct.

14.68 All meet the criteria for habitat of Principal Importance under Section 41 of the NERC Act, with two also being 'Important' under the Hedgerow Regulations 1997. Overall, this habitat is of moderate conservation significance and for the purpose of this assessment is considered to be of Local level importance.

Watercourses

14.69 There are three notable watercourses/ land drains which run approximately west to east through the Site and along the boundaries, all of which feed into Hey Beck on the eastern boundary of the Site.

14.70 The northern-most watercourse is a tributary of Hey Beck, which for most of the year is mostly dry, with a few damper areas at the time of survey. The tributary is lined with, and heavily shaded by mature trees and choked with dense scrub and tall ruderal vegetation.

14.71 The central drainage ditch, exits a culvert alongside the south of Dogloitch Wood and runs along the full extent of the southern side of this woodland. The ditch appears to collect surface runoff from the surrounding arable land; at the time of survey, the ditch was wet and shaded in places by scattered semi-mature trees.

14.72 The southern tributary forms the southern boundary to the Site. At the time of survey, this ditch was partially dry with no visible areas of open water. As the watercourse runs further east, the banks become increasingly vegetated.

14.73 These three watercourses, and their associated bankside vegetation, are of moderate conservation significance and for the purpose of this assessment is considered to be of Local level importance. Drainage ditches are of Site Level Importance.

Inundation vegetation

14.74 A small area of flat, low-lying ground is present towards the eastern end of the watercourse, which is subject to flooding and supports a typical wet grassland/ tall herb community.

Scattered Broadleaved Trees

14.75 Scattered broadleaved trees are present across the site. Often associated with field boundaries, they are predominantly Oak and Ash. There is a line of small mature oak trees in the east of the site adjacent to Dogloitch Wood. Other species found individually on site include silver birch (*Betula pendula*) and large hawthorns.

14.76 For the purpose of this assessment, scattered trees (outside of hedgerows and woodlands) are considered to be of no more than Site level importance.

Buildings and Hardstanding

14.77 A small World War 2 building exists in the south western corner of the Site to the east of the farm. This is now used as storage but originally housed generators. It is a red brick structure, approx. 3m tall with a flat roof. The Site also encompasses a single detached and three semi-detached residential properties along the western boundary. This habitat is considered to be of less than Site level importance.

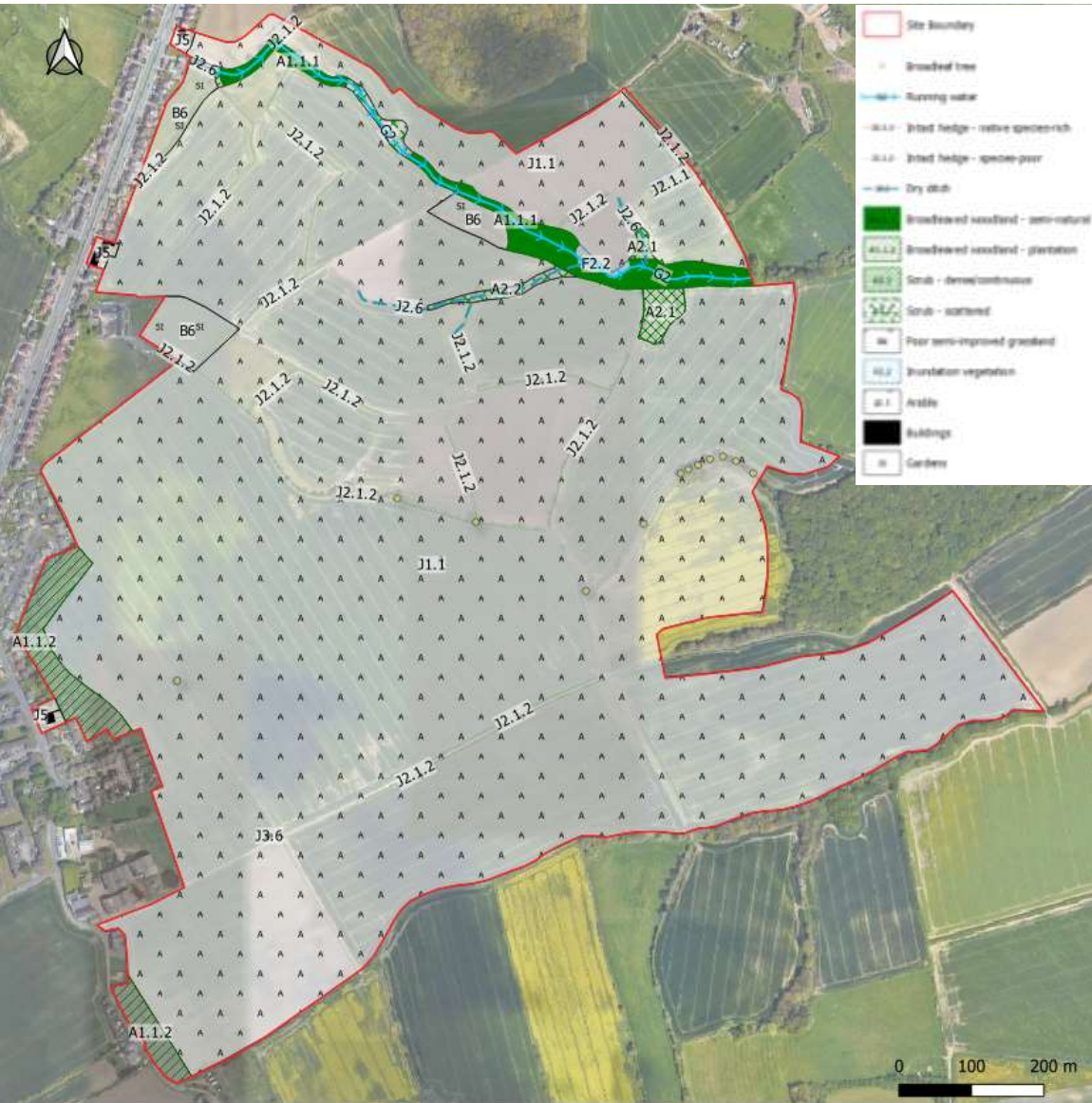
Gardens

14.78 Small vegetated private gardens are associated with each of the residential properties situated along the Site's western boundary. This habitat is considered to be of Site level importance.

Table 14.4 – Summary of Habitats

Habitat	Extent	Notes	Sensitivity to change
Arable	102.25 ha	Extensive but of low conservation significance, with similar habitat being abundant locally. Site level importance only.	Low
Poor Semi-improved grassland	1.78 ha	Site level importance only.	Low
Scrub	0.91 ha	Site level importance only.	Low
Broadleaved woodland – Semi-natural	1.67 ha	On Site woodland is currently of Site level importance only.	Moderate
Broadleaved woodland Plantation	1.84 ha	Young plantation is currently of Site level importance only.	Low
Buildings	0.06 ha	Negligible ecological value	Low
Gardens	0.27 ha	Site level importance only	Low
Inundation vegetation	0.12 ha	Site level importance only	Moderate
Hedgerows	3725m	Most are of low quality, but all will qualify as NERC Act habitat, whilst some are 'important' under the Hedgerow Regulations. <u>Local level importance.</u>	Low
Watercourse	875m	Green corridor of <u>Local level importance</u>	High
Drainage ditches	526m	Site level importance only	Low
Scattered Broadleaved Trees	-	Site level importance only	Low

Figure 14.3 Phase 1 Habitat Plan



Biodiversity Metrics Calculation

- 14.79 In an effort to quantify the biodiversity value of on-site habitats, the Natural England Calculation Tool 'The Biodiversity Metric 2.0' has been used. This calculator returns a Habitat Unit value for each habitat, based on factors such as type, extent (ha), distinctiveness and condition. A total habitat unit score is then generated for the Site which then equates to the Site's Ecological Baseline, allowing comparison between pre and post development baselines. The Calculator generates three Habitat Unit Totals, based on three broad habitat categories, Area Habitats (A-1) and linear habitats; Hedgerows (B-1) and Rivers (C-1).
- 14.80 The table below runs through each of the Site's habitats, listing the habitat types, extent and Habitat Units. Habitat types vary between the JNCC classification (used for Preliminary Ecological Appraisals) and the UK Habitat Classification (used for Biodiversity Metrics); to confirm which habitat types have been used in the calculations, both are provided in the table below.

Table 14.5 – Biodiversity Metrics – Baseline Score

JNCC Classification	Habitat	UK Habitat Classification	Extent (ha)	Ecological Baseline – Habitat Units
Arable		Cropland – Cereal crops	102.25	204.50
Poor Semi-improved grassland		Grassland – Modified grassland	1.78	3.56
Scrub		Heathland and shrub – mixed scrub	0.91	5.46
Broadleaved woodland – Semi-natural		Woodland and forest – Other woodland: broadleaved	1.67	10.02
Broadleaved woodland Plantation	-	Woodland and forest – Other woodland: Young Trees Planted	1.84	7.36
Buildings		Urban – Developed land; sealed surface	0.06	0.00
Gardens		Urban – Vegetated garden	0.27	0.54
Inundation vegetation		Grassland – Tall herb communities	0.12	1.08
Drainage ditches		Lakes – Ditches	526m	2.12
A-1 Site Habitat Baseline				234.64
Hedgerows		Native Hedge	3725m	7.45
B-1 Site Hedgerow Baseline				7.45
Watercourse		Rivers & Streams (Other)	875m	7.04
C-1 Rivers Data				7.04
Scattered Broadleaved Trees	-		-	-

Species and Species Groups

14.81 The following detailed studies were undertaken to confirm the status of notable or protected species. There are described in turn below:

Great Crested Newt

14.82 All ponds, situated within a 500m radius of the Site, and not separated by significant barriers to amphibian movement, have been subject to a Habitat Suitability Index (HSI) Assessment and found to present 'poor' potential breeding habitat for great crested newt (GCN).

14.83 These ponds and the Site are therefore highly unlikely to support GCN and the risk of this species being impacted by the Proposed Development is considered to be negligible.

Barn Owl

14.84 A scoping survey undertaken in March 2018 by an experienced professional Ornithologist found the Site to be is of very low potential to support breeding or roosting by this species. Likely absence can therefore be concluded.

Breeding Bird Survey

14.85 Breeding birds were widespread throughout the Site, particularly within the northern and the eastern halves, with hedgerows and tree-lines within the site and the woodland edge of Dum Wood and Dogloitch Wood (adjacent to the site red-line boundary) supporting the highest

abundance and distribution of breeding. Overall, fewer breeding territories or breeding pairs of bird species of conservation concern were recorded within habitats along the western margin of the site (between Leeds Road and Dum Wood), immediately east of residential housing along Leeds Road and east of Chidswell, Windsor Farm and Chidswell Farm.

14.86 The breeding bird species assemblage within the site includes an important breeding population of Yellowhammer, which were associated with hedgerows and tree-lines. In addition, an important breeding population of Skylark is present, associated with the open fields of arable farmland.

14.87 In assigning ornithological value to the Site it is important to recognise the high numbers of breeding birds present in habitats within the Site red-line boundary and in peripheral habitats adjoining the Site. Alongside breeding and foraging habitat, hedgerows and tree-lines also provide connectivity across the Site for birds. These factors combine to produce a relatively high degree of breeding bird diversity and therefore the ornithological value of the site should, overall, be considered at a District level importance.

Badger

14.88 No evidence of badger activity was found anywhere on Site, and the current likely absence of this species can be reasonably concluded.

Bat Roosting

14.89 Trees - Of the trees inspected, the majority have been assessed as being of negligible bat roost suitability and do not require any further survey. Five individual onsite trees, along with five offsite trees and two offsite woodland blocks have been assessed as containing features with bat roost suitability and these will require further survey or precaution if they are to be directly impacted upon by development.

14.90 Buildings – Emergence surveys of two properties with low bat roost suitability has concluded there is a likely absence of bat roosts.

Bat Activity

14.91 Despite the Site's large size, survey has found the Site to be of relatively low importance to this group, with very limited foraging and commuting activity observed. This group is not considered to have any significant dependence on the Site and is considered to be of no more than Site level importance.

Water vole

14.92 No evidence of water vole activity has been found within any of the on-Site, or neighbouring, watercourses or ditches. The likely absence of this species can therefore be reasonably concluded.

Reptile

14.93 No evidence of reptiles has been found on Site, however given its size, it is not possible to completely rule out this group's occasional presence at very low density. This group is considered to be of no more than Site level importance.

Table 14.6 – Summary of Species / Species Group Surveys

Species/ Species group	Notes
Great crested newt	Likely absence demonstrated

Barn Owl	Likely absence demonstrated
Breeding Bird	High number of breeding birds present. Species of particular note are Yellowhammer and Skylark. <u>District level importance</u>
Badger	Likely absence demonstrated
Bat Roosting	<u>Trees</u> – Some trees with roost potential <u>Buildings</u> - Likely absence demonstrated
Bat Activity	Very limited activity (foraging/commuting) – <u>Site level importance</u>
Water vole	Likely absence demonstrated
Reptile	Likely absent, or present at very low density – <u>Site level importance</u>

Invasive Non-Native Species

14.94 Himalayan Balsam (*Impatiens glandulifera*) is scattered throughout the site, concentrated along the central watercourse, damp ditches, woodland edges and some field margins. The presence of this species is considered to be Local level importance.

14.95 No other plant species listed of Schedule 9 of the Wildlife and Countryside Act (1981) have been identified on Site.

Identification and Evaluation of Likely Significant Effects

14.96 Brooks Ecological were instructed at an early stage in the design process to undertake a full suite of detailed ecological surveys at the Site. This has allowed a clear baseline to be collected, with the results of these surveys being fed into the design of the Parameter Plans and illustrative masterplan.

14.97 Identifying the Important Ecological Features (IEFs) at an early stage has allowed the hierarchical process of avoiding, mitigating and compensating ecological impacts to be effectively employed, with potential ecological issues largely being addressed through embedded mitigation.

Important Ecological Features

14.98 Table 14.7 overleaf, summarises the Important Ecological Features which have been identified for the Site. Only habitats and species/ species groups of Local or greater significance are taken through the EcIA as Important Ecological Features. These are taken forward in the next section where the potential effects to these receptors in the absence of mitigation are considered.

Table 14.7 – Summary of Habitats

Important Ecological Feature	Geographical context	Notes
Dum Wood & Dogloitch Wood LWS, SWS, KWHN	District	Locally designated woodland with high bluebell density cover. Also covered by the Kirklees Wildlife Habitat Network.
Hedgerows	Local	Most are of low quality, but all will qualify as NERC Act habitat, whilst some are 'important' under the Hedgerow Regulations.
Watercourse	Local	Green corridor likely to be of importance to local wildlife.
Breeding Bird	District	High number of breeding birds present. Species of particular note are Yellowhammer and Skylark.
Invasive Non-Native Species	Local	Himalayan balsam scattered throughout the Site.

During Construction

14.99 As the first stage of works, land within the development footprint will need to be prepared; this will involve earthworks to create the necessary development platforms. Following this will be the construction of new access roads, residential and employment units, along with the installation of all necessary utilities and services. Work will be undertaken in phases, with a temporary site compound erected in each phase, along with storage areas for equipment, machinery and materials. Towards the end of this stage, landscaping will be installed on a phased basis.

14.100 This stage will present the major impact in relation to ecology, as it will see direct impacts on habitats and species / species groups through vegetation clearance, as well as indirect impacts from disturbance (noise, vibration, lighting, increased human presence, vehicular movement) and the potential for inadvertent release of pollutants.

Dum Wood & Dogloitch Wood LWS, SWS, KWHN

14.101 Direct impacts on these two woodlands blocks were designed out of the proposals at an early stage. This was achieved by amending the red line boundary to maintain a c.20-30m wide green stand-off from the woodland edge.

14.102 Despite this standoff, in the absence of mitigation, minor indirect impacts could still occur. Without a clear exclusion zone being marked out on the ground, contractors could encroach within the canopy spread or root protection area of the woodland edge trees, resulting in physical damage to trees through collision, damage to roots by compaction/ severance and damage to the health of trees by spilling hazardous chemicals. The release of airborne pollutants (namely dust), could also lead to short term damage of the woodland ground layer.

14.103 This impact would negative and short lived, affecting only those trees and ground flora along the woodland edge. The impact would be felt for the duration of the construction period and would be reversible. The likely significance of this impact would be minor and the sensitivity low. The magnitude of the effect would only extend to the woodland edge bordering the Site.

Hedgerows

14.104 Direct impacts would occur through targeted clearance of all hedgerows that conflict with the development footprint. This clearance would proceed as the first stage of works within each development phase, with woody material being chipped and spread nearby.

14.105 Hedgerows that lie within Publically Accessible Open Spaces would be retained, but at risk of damage by construction activities. Potential impacts are similar to those described above for the woodland edge trees.

14.106 This impact would negative and restricted to the Site, impacting only hedgerows within the red-line boundary. The impact would be felt for the duration of the construction period and would be reversible with mitigation. The magnitude of this impact would cover all onsite hedgerows, although the likely significance would be minor. The sensitivity to change would be low.

Watercourse / Green Corridors

14.107 The parameter plan shows the watercourse retained in its current channel. However, as shown in the parameter plan, two new bridge points will need to be constructed across the watercourse, to the east and west.

14.108 Construction of the new bridge points will result in small scale habitat loss and fragmentation, with watercourse at these points being diverted under the new roads through culverts. This impact will be negative and irreversible, occurring once during the construction period, but with impacts being felt at a small (Site-wide) scale.

14.109 Construction of the new bridge points, together with wider groundworks within close proximity of the channel also have the potential to result in minor indirect impacts, through the release pollutants (i.e. silt or hazardous chemicals). This impact would be negative but reversible through spontaneous recovery. It could occur numerous times throughout the construction period and would potentially be felt over a large geographical area, with pollutants being carried downstream. Each time the effect would be short-term and temporary. The likely significance of this impact would be moderate.

Breeding Bird Survey

14.110 Works associated with this stage will result in high, but localised (confined to each particular phase), levels of disturbance. This is likely to result in temporary displacement of many of the species noted on Site, either to sections of the Site not being developed, or from the Site entirely. For most of the bird assemblage recorded, this impact is likely to of no more than Site level significance.

14.111 With regards to yellow hammer (hedgerows) and skylark (arable fields), development is likely to result in long term displacement; this impact will be negative at a district scale and would be largely irreversible. The likely significance of this impact would be major.

Invasive Non-Native Species

14.112 In the absence of mitigation, construction activities would lead to the large-scale spread of invasive weeds through the Site. Viable material could also be transported off-site, on the wheels of heavy machinery, resulting in off-site contamination. This impact would be negative and felt over a potentially large geographical scale. It would however be reversible with mitigation. The likely significance of this impact would be moderate.

Table 14.8 – Summary of predicted impacts of the Construction Phase, in the absence of mitigation

Important Ecological Feature	Predicted Likely Impact(s)	Likely Significance
Dum Wood & Dogloitch Wood LWS, SWS, KWHN (District)	Indirect damage to woodland edge trees and ground layer	Minor Negative

Hedgerows (Local)	Loss of hedgerow cover. Damage of retained hedgerows.	Minor Negative
Watercourse (Local)	Small scale habitat loss. Indirect impacts on watercourse through pollution events.	Moderate Negative
Breeding Bird (District)	Displacement of most breeding bird assemblages, including notable yellowhammer and skylark populations.	Major Negative
Invasive Species (Local)	Non-Native Large scale spread of invasive weeds through the Site, as well as off-site contamination.	Moderate Negative

During Operation

14.113 This stage will have the longest lasting effects and will ultimately see 1,354 new homes and 35 hectares of employment development being occupied, along with a new primary school, a local centre, green space and other associated infrastructure. This will obviously result in traffic generation on new and existing roads, along with the presence of large numbers of people within the Site and accessing local footpaths and the presence of domestic pets. Homes, gardens and the Site's roads will all be illuminated.

14.114 It is anticipated that the Site's landscaping will be carried out by future developers on a phase by phase basis. The management of the Site may be undertaken by a Management Company but this will be determined following further discussions with the Council. Management will include provision for the habitat areas around the Site, although in the absence of mitigation this is likely to involve only non-specialist intervention by the same Maintenance Company.

Dum Wood & Dogloitch Wood LWS, SWS, KWHN

14.115 In the absence of mitigation, this stage would see a significant uptake in usage of these woodland blocks by local residents; for dog walking and other recreational purposes (e.g. mountain biking). Although public access is currently permitted, use is low level and restricted to a small number of unmade footpaths. Increased use is likely to lead to the proliferation of informal footpaths and damage to the diverse woodland ground layer (bluebells), for which these woodlands are primarily designated. The risk of fly tipping would also increase.

14.116 Without access to the more sensitive areas being restricted or formalised, it is likely that the swathes of species-rich ground flora would be trampled, dug up and the soil severely compacted; degrading the floral communities and leading to the loss of biodiversity here.

14.117 These impacts would be negative and significant at district level. Impacts could be felt within both woodland blocks and continue for the lifetime of the development, and thus would be frequent and long term. Impacts on the diverse ground layer would be irreversible if lost, with the magnitude of effects covering the entire woodland area. The likely significance of this impact would be major with the sensitivity to change being high.

Hedgerows

14.118 Located within residential and light industrial settings, retained hedgerows would be at risk of degradation through inappropriate management. Cutting too frequently could discourage wildlife from using them and would prevent flowering and berry/ nut production.

14.119 This impact would be negative but reversible under the right cutting regime. The likely significance of this impact would be minor.

Watercourse / Green Corridors

14.120 Although not shown within the parameter plan, it is anticipated that the watercourse will be located within formal Publically Accessible Open Space. It is presumable that the watercourse would receive excessive management to maintain an appearance of 'tidiness', which in the medium to long term would lead to a loss of diversity. The landscape contractors could also make indiscriminate use of herbicides and pesticides, which could then leach into the watercourse leading to eutrophication.

14.121 With such high numbers of new residents, it is not unfeasible for invasive species to be accidentally or purposefully released into the watercourse; such as invasive water plants arriving from new garden ponds on the feet of wildlife, or planted by residents, or releasing unwanted pets (exotic fish, newts/ amphibians, terrapins, etc.) or coarse fish/ crayfish for fishing. All of these actions could lead to the loss of floral/ faunal diversity.

14.122 The impacts would be negative and significant at a Local level. They could be felt on all on-site waterbodies and reoccur frequently over the lifetime of the development. However, individually, none of the ponds are considered to be unique, and the impacts could be easily reversed through measures such as dredging or suitable management. The likely significance of this impact would be moderate.

Breeding Bird Survey

14.123 The Site's change of use is likely to result in a shift in the Site's bird assemblage, with a decrease in many of the farmland and woodland species currently recorded, and an increase in more typical urban/ garden bird species. Many of the new residents are likely to actively encourage birds onto the site, putting up bird boxes and bird feeders.

14.124 Indiscriminate use of the mature woodland blocks by dog walkers and new residents is likely to cause high levels of disturbance during the breeding season – displacing many of the woodland birds. Excessive light spill on retained hedgerows would have similar effects of farmland bird species and the introduction of predatory domestic pets will decrease recruitment of most bird species.

14.125 Impacts on birds would therefore be mixed, with some species being negatively affected, and some positively. Overall, given the Site's size, these impacts are likely to be significant at a local level. The likely significance of this impact would be moderate.

Invasive Non-Native Species

14.126 Without long term management/ control, invasive weeds would spread throughout the Site's publically accessible open spaces, reducing floral diversity. Along the watercourse, Himalayan balsam would leave the banks unvegetated into the winter, leading to increased run-off of silt release.

14.127 This impact would be negative but reversible. The likely significance of this impact would be moderate.

Table 14.9 – Summary of predicted impacts of the Operational Phase, in the absence of mitigation

Important Ecological Feature	Predicted Likely Impact(s)	Likely Significance
Dum Wood & Dogloitch Wood LWS, SWS, KWHN (District)	Increased pressure on woodland by new residents. Trampling of diverse woodland ground layer.	Major negative

Hedgerows (Local)	Inappropriate management	Minor negative
Watercourse (Local)	Inappropriate management Use of herbicides and pesticides. Release of none-native flora/ fauna.	Moderate negative
Breeding Bird (District)	High levels of light disturbance leading to long term displacement of many species Increase in urban habitats could lead to increase in some species	Moderate negative
Invasive Non-Native Species (Local)	Increased spread of invasive weeds throughout publically Accessible Open Space.	Moderate negative

Mitigation Measures

14.128 Many of the potential impacts identified for the various Important Ecological Features (IEFs) crossover, and are interlinked; such as Breeding birds and Hedgerows, Invasive Species and Watercourse, etc. The mitigation being put forward to address an impact on one of the IEFs is therefore likely to mitigate a similar impact on one or more of the other IEFs. As such, the following section discusses Mitigation/ Compensation measures proposed for the Site as a whole, rather than separately for each IEF.

14.129 Mitigation is focussed on the retention and protection of key habitats and faunal populations, with any losses over-compensated for through long term management and enhancement of lower value retained habitats, or the creation of new higher value habitats within the allocated greenspace. Throughout the design stage, the importance of retaining connectivity through and around the site, has been clearly conveyed, allowing green infrastructure to be embedded into the scheme as shown in the Green Infrastructure Parameter Plan, ensuring the Site remains permeable for resident wildlife throughout the lifetime of the scheme.

14.130 The following sections discuss the broad mitigation and compensation measures proposed, to reduce or remove negative effects on the IEFs at each stage of development. However, it is envisioned that full details of these mitigation strategies will be contained within the Construction Environment Management Plan (CEMP) - which will detail measures to be taken to protect retained habitats and faunal populations during construction; and the Biodiversity Management Plan (BMP) - which would provide the necessary detail for successful enhancement of retained habitats and creation of new ones, as well as their ongoing management during operation of the Site. BS42020 provides suitable standard conditions for securing such plans as part of a permission.

During Demolition

Ecological Clerk of Works

14.131 An Ecological Clerk of Works (ECoW) will be appointed at the inception of each phase, they will be able to supervise, inspect works, provide advice and carry out surveys as required. Their anticipated role in each phase would be outlined in the relevant CEMP.

Exclusion fencing

14.132 Many of the potential impacts on the priority habitats can be avoided, or significantly reduced through the installation, and maintenance, of exclusion fencing. This would be installed once any vegetation clearance works have been completed, and prior to the start of construction activities commencing on Site, and remain in place throughout the construction phase.

14.133 The exact location of the fencing would be confirmed once full details of each phase of development has been finalised, and would entirely enclose each development compartment. This would enforce standoffs from the retained habitats (namely Dum Wood and Dogloitch Wood, retained Hedgerows and the Watercourse), and prevent heavy machinery, equipment and materials encroaching outside of the construction footprint.

14.134 If required, provision will be made for vegetation clearance to be directional, thus providing any fauna inadvertently trapped within the development compartment opportunity to escape.

14.135 As well as preventing demolition works affecting retained habitats, the barrier fencing installed around the watercourse will have a dual purpose of preventing sediment run-off. The fencing here will be adapted to support Silt Trap Fencing, slowing down runoff and preventing sediment from being leached into the watercourse.

Tool-Box Talk

14.136 In tandem with the installation of exclusion fencing, a meeting will be arranged with all parties involved in this stage of the works, prior to any works commencing. The aim of this meeting will be to ensure all relevant parties, in particular those contractors involved on the ground actually completing the works, are well aware of the ecological issues relating to the Site, and to the importance of the exclusion fencing remaining in place and intact.

14.137 A system will be put in place with contractors and the Site Managers to ensure that any breaches in the fencing are reported immediately and repaired as an upmost priority.

Housekeeping

14.138 Site compounds will be sited away from the watercourse and woodland, and all hazard chemicals will be safely stored within bunded compounds.

14.139 To minimise disturbance to nocturnal wildlife, work, wherever feasible, will be restricted to daylight hours. On occasions when this is not possible, any artificial lighting used will be directed within the development compartment, and away from retained higher value habitats.

Habitat Creation

14.140 Loss of existing low-distinctiveness habitat (namely arable, with minor losses in hedgerow and improved grassland) will be to some extent compensated for through new habitat creation, with the opportunity for linear blocks of wildflower grassland, lakes and extensive tree planting through the Site. Although smaller in extent to those habitats lost, new habitat will aim to be significantly more diverse and provide stronger connective functions.

14.141 At a smaller scale within the development, a mix of formal/ornamental and more naturalistic landscaping will take place within the residential and light industrial areas.

Underpasses

14.142 A network of green corridors has been designed into the scheme to allow wildlife to continue to move through the Site following construction; this is shown in the Green Infrastructure parameter plan. Finer Details will be provided at the Reserved Matters stage. These will be Planted Up in part with semi-natural habitats (native tree planting, wildflower grassland, wetland vegetation) to strengthen their connective function, and sited so as to connect with the priority woodlands. Although not shown on the parameter plans, it is anticipated that some new roads will intercept these green corridors. To prevent roads acting as barriers, dedicated wildlife underpasses will need to be strategically positioned around the Site; this will be detailed at the Reserved Matters stage.

Invasive species eradication

14.143 The spread of Himalayan balsam throughout the watercourse, woodlands and arable field margins will ultimately lead to the loss of diversity. To prevent this, an Invasive Species Management Plan will be devised and implemented, to remove this plant from Site.

After Completion – During Operation

Ecological Enhancement & Management

14.144 All new and retained semi-natural habitats will be subject to long term ecological management to maximise their wildlife value. Along the watercourse and new SUDS, the aim will be to increase the margins, with species rich wetland planting. Linear habitats, planted up along the green infrastructure, will be managed primarily so as to provide cover for wildlife.

Woodland Management Plan

14.145 Adverse effects on the woodland ground layers of Dum Wood and Dogloitch Wood will be minimised through a dedicated Woodland Management Plan. This could include the installation of information boards near the woodland entrances, making the public aware of the important plant assemblages present. Other measures could include improving the existing footpath infrastructure, installation of litter and dog waste bins, litter picking and management of the woodland habitat itself to promote diversity. There could also be an aim to create a 'friends of group', to take on responsibility for management of the woodland into the long-term as one option.

Lighting Scheme

14.146 A sensitive lighting scheme will be produced at reserved matters stage on a phased basis, which will demonstrate how development can proceed without excessively lighting the new and retained semi-natural habitats, namely the watercourse, woodland and hedgerows. This will aim to avoid or significantly reduce the impacts of disturbance on nocturnal wildlife.

Cumulative Effects

14.147 Possible cumulative impacts have been identified for two adjacent development sites; these being a residential scheme to the southwest of the Site being progressed by Barratt Homes for 252 dwellings (application reference: 2019/62/92787/E) and C.C. Projects Heybeck Lane proposals to the immediate north of the Site.

14.148 Of the five IEFs identified on Site, only one (Breeding Birds) is likely to experience any significant in-combination effects from these two developments. Being predominantly arable land, a similar breeding bird assemblage is likely to be present on both sites, including skylark and yellow hammer. The two development sites are therefore likely to impact on the same local bird populations.

Residual Effects

14.149 Mitigation has allowed many of the potential impacts to be avoided, or significantly reduced, with it being possible to downgrade the effect of many of the residual impacts from negative to neutral or minor positive.

14.150 With a development site of this scale, some impacts remain significant, and are very hard to mitigate, especially in the case of disturbance from factors such as noise, lighting and increased human presence. Regardless of what measures are put in place, some of the most sensitive species/ species groups (farmland breeding birds) are likely to be displaced from the Site, either temporarily or long term.

Table 14.10 – Summary of Receptors, Likely Significant Effects, Mitigation Measures, and Residual Effects

Likely Effect	Significant	Receptor(s)	Mitigation Measure	Residual Effect
Construction Phase				
Minor indirect effects from disturbance/ damage of retained habitats		Dum Wood & Dogloitch Wood Hedgerows Watercourse	Production of a CEMP which will detail: • Appointing an ECoW • Incorporating Tool-box talk into Site inductions • Good Housekeeping • Installing Barrier Fencing	Negligible effects from indirect damage and disturbance
Minor/ moderate negative effect from habitat loss		Hedgerows Watercourse	Production of a BMP which will detail habitat creation	Minor Positive Impact from Habitat Creation
Major negative effect from displacement of breeding birds		Breeding birds	Production of a BMP which will detail new foraging/ nesting opportunities for birds.	Major negative effect from displacement of current breeding bird assemblage
Moderate negative effect from spread of INNS		Invasive Non-Native Species	Production of an Invasive Weed Management Plan.	Minor Positive effect from control/ removal of INNS from Site.
Operational Phase				
Major negative impact on woodland habitat from increased human activity		Dum Wood & Dogloitch Wood	Scope of the BMP will be widened to take in these two woodlands, or a separate Woodland Management Plan will be produced to manage impacts on these habitats.	Negligible impact on woodland from increased human pressure.
Minor/ moderate negative impact from inappropriate management of priority habitats		Hedgerows Watercourse	Production of a BMP which will detail long term management of new and retained habitats	Moderate positive effect on new and retained habitats from 'wildlife friendly' management
Moderate negative impact from disturbance of local breeding bird assemblages		Breeding birds	Production of a BMP which will detail new foraging/ nesting opportunities for birds.	Minor negative effect from displacement of local breeding bird assemblage
Moderate negative effect from spread of INNS		Invasive Non-Native Species	Production of an Invasive Weed Management Plan.	Minor Positive effect from control/ removal of INNS from Site.

Summary

14.151 The Site's baseline has been thoroughly assessed and a number of habitat and species/ species groups have been identified as Importance Ecological Features. Parameter plans have been

mindful of these ecological constraints and will allow for the connectivity of habitats through the Site and, for the most part, the retention and protection of key habitats and features.

14.152 The proposals are subject to an outline application with access only included for determination. A number of detailed matters will be addressed on a phase by phase basis through subsequent reserved matters submissions. These include:

- Details of how precautions and mitigation relating to protected species and invasive species will be dealt with in terms of each phase. It is likely that updating survey data on some or all of these would be required at this time.
- Details of the protection of retained habitat and the prevention of pollution / disturbance of habitats around the Site.
- Details of habitat creation and management.

14.153 It is therefore anticipated that the following would be secured through conditions similar to those set out in the British Standard BS 42020 (2013):

- Biodiversity Management Plan (BMP)
- Construction Environmental Management Plan (CEMP)
- Invasive Weed Management Plan (IWMP)

14.154 Detailed wording will need to be agreed with the Council and should provide the flexibility to allow the consideration of ecological matters on a phase by phase basis as the Proposed Development is delivered over time.

Reference List

Ref. 1 – Ministry of Housing, Communities & Local Government (Feb. 2019). National Planning Policy Framework (NPPF).

Ref. 2 – Kirklees Council (Adopted 27 Feb. 2019). Kirklees Local Plan, Kirklees Local Plan Strategy and Policies.

Ref. 3 – The Conservation of Habitats and Species Regulations 2010. <http://www.defra.gov.uk/wildlife-pets/wildlife/protect/bird-habitat/habitat2010.htm>

Ref. 4 – Wildlife and Countryside Act (1981) as amended
<[http://www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1981/cukpga 19810069](http://www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1981/cukpga%2019810069)>

Ref. 5 – The Countryside and Rights of Way Act (2000) [http://www.opsi.gov.uk/Acts/acts2000/pdf/ukpga 2000037 en.pdf](http://www.opsi.gov.uk/Acts/acts2000/pdf/ukpga%202000037en.pdf)

Ref. 6 – The Natural Environment and Rural Communities Act (2006) [http://www.opsi.gov.uk/acts/acts2006/pdf/ukpga 20060016en.pdf](http://www.opsi.gov.uk/acts/acts2006/pdf/ukpga%2020060016en.pdf)

Ref. 7 – Kirklees Biodiversity Action Plan (BAP) < <https://www.kirklees.gov.uk/beta/delivering-services/policies-and-strategies.aspx> >

Ref. 8 – Nature Conservation Committee (1990). Handbook for Phase 1 Habitat Survey: A technique for environmental audit. JNCC

Ref. 9 – CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

Ref. 10 – Multi Agency Geographic Information Centre (MAGIC) <<https://magic.defra.gov.uk/MagicMap.aspx>>

Ref. 11 – Promap <<https://www.promap.co.uk/>>

Ref. 12 – Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great

Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4), 143-155.

- Ref. 13 – Marchant, J.H. 1983. Common Birds Census instructions. BTO, Tring. 12pp. A major summary of the results (and included results from some other BTO surveys) up to 1988 was included in a BTO book: Marchant, J.H., Hudson, R., Carter, S.P. & Whittington, P. 1990. Population Trends in British Breeding Birds. BTO, Tring.
- Ref. 14 – Gibbons & Evans (1998). Bird Monitoring Methods. RPSB.
- Ref. 15 - Hardey et al. (2009). Raptors; A field guide for survey and monitoring. The Stationery Office, Edinburgh.
- Ref. 16 – Shawyer, C. R. 2011. Barn Owl *Tyto alba* Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting. IEEM, Winchester.
- Ref. 17 - Barn Owl Trust (2012). < <https://www.barnowltrust.org.uk/weather-woe-owls-june-2012/>>
- Ref. 18 – Bat Conservation Trust (2016) Bat Surveys – Good Practice Guidelines
- Ref. 19 - Strachan & Moorhouse 2016, 2nd Edition Water Vole Conservation Handbook, University of Oxford.
- Ref. 20 – Gent T and Gibson S, 2003, Herpetofauna Workers' Manual, JNCC
- Ref. 21 – DEFRA. The Hedgerows Regulations 1997: A Guide to the Law and Good Practice.

15 Type 1 Effects

- 15.1 This Chapter assesses 'Type 1' cumulative effects, drawing on the results of the technical assessments contained in Chapters 6 to 14 of this ES and as summarised in Chapter 15 of this ES.
- 15.2 Type 1 cumulative effects are also known as 'intra-project' effects which are the effects which can occur due to different environmental impacts arising from the same proposal. These are the combined effects arising from the Proposed Development upon a set of defined sensitive receptors which are known as inter-relationship effects.
- 15.3 Type 2 cumulative effects are considered within Chapters 6 to 14 of this ES. The technical chapters also had regard to the potential for Type 1 cumulative effects, however for robustness the results of a standalone assessment of these are provided below.

Legislation, Policy and Guidance

Legislation

- 15.4 There is no legislation outlining how cumulative effects should be assessed. EIA Regulations Schedule 4(5) states that the EIA should consider cumulative effects. Cumulative is not defined in the EIA Directive or Regulations however a dictionary definition is 'increasing by one addition after another'.
- 15.5 The EIA Regulations require 'a description of the likely significant effects', including cumulative effects.
- 15.6 In the context of this assessment, 'cumulative effects' refers to the interactions between different likely residual effects resulting from the Proposed Development (Type 1) on the same receptor. Both positive and negative effects are considered across the construction and operational phases.

Policy

- 15.7 As this chapter considers the cumulative effects of the technical areas within the ES, all relevant policy has already been reviewed within the individual technical chapters.

Guidance

- 15.8 A number of guidance documents which relate to assessing cumulative effects have been used to inform the assessment and include:
- European Commission (EC) Environment DG (May 1999), 'Study on the Assessment of Indirect and Cumulative Impacts as well as Impact Interaction', Hyder Consulting;
 - Institute of Environmental Management and Assessment (1992), Guidelines for the Environmental Assessment of Road Traffic; and
 - IEMA, 'The State of Environmental Impact Assessment in Practice in the UK' (2011)
- 15.9 The EC guidelines 'are not intended to be formal or prescriptive, but are designed to assist EIA practitioners in developing an approach which is appropriate to a project'.
- 15.10 As set out in the IEMA article 'Cumulative effects assessment: a call to arms' (April 2019) there is currently little industry guidance on the assessment of Type 1 cumulative effects, with no clear, agreed approach.

Assessment Methodology and Significance Criteria

Methodology

- 15.11 This assessment is primarily concerned with the scenario where there is a likelihood of significant Type 1 cumulative effects occurring, in accordance with EIA practice and the NPPG guidance.

- 15.12 The assessment is based on experience and professional judgement, drawing upon relevant guidance as referenced above and the residual environmental effects identified within the results of the EIA technical assessments. The assessment has been undertaken by suitably qualified and experienced EIA practitioners.
- 15.13 The assessment has primarily focused on sensitive receptors identified on the Site and within close proximity to the Site, likely cumulative effects on those receptors, and their capacity to accommodate changes that will occur as a result of the combined residual environmental effects.
- 15.14 Relevant guidance has been reviewed, and an approach has been developed that uses the residual environmental effects identified within the ES. An exercise that tabulates the residual effects against receptors or their receiving environments has then been carried out in order to identify the potential for Type 1 cumulative effects which is presented in Chapter 15.
- 15.15 Negligible or neutral residual effects have been excluded from the assessment as, by their nature, they are considered to be imperceptible. Therefore, only minor, moderate or major effects have been given consideration during the Type 1 cumulative effects assessment.
- 15.16 For the purposes of the assessment, sensitive receptor groups have been identified as those on and surrounding the Site and those identified within the individual technical assessments.

Significance Criteria

- 15.17 The following terms have been used to define the significance of the effects identified:
- Major effect: where inter-relationship effects arising from the Proposed Development could be expected to have a very significant effect (either positive or negative) on a defined receptor / receiving environment;
 - Moderate effect: where inter-relationship effects arising from the Proposed Development could be expected to have a noticeable effect (either positive or negative) on a defined receptor / receiving environment;
 - Minor effect: where inter-relationship effects arising from the Proposed Development could be expected to result in a small, barely noticeable effect (either positive or negative) on a defined receptor / receiving environment; and
 - Negligible: where no discernible inter-relationship effects are expected as a result of the Proposed Development on the defined receptor / receiving environment.
- 15.18 The significance level attributed to each effect has been assessed based on the magnitude of change due to the combination of residual effects and the sensitivity of the affected receptor/receiving environment to change, as outlined in Chapter 2 of the ES. Magnitude of change is assessed on a scale of major, moderate, minor and negligible and the sensitivity of the affected receptor/receiving environment is assessed on a scale of high, moderate, low and negligible. Major and moderate effects are considered to be significant for EIA purposes.

Limitations and Assumptions

- 15.19 Due to the reliance on qualitative data and subjective opinion, there are limitations related to the range and depth in which the cumulative effects have been investigated. Analysing the cumulative effects of developments is often speculative and cannot be predicted as clearly as individual effects such as the effects upon traffic of a development, which is based upon quantitative data. As a result, a number of assumptions have been made throughout in terms of the outcome of the accumulation of effects and based upon professional judgement. This section and the assessment process of identifying the likely significant Type 1 cumulative effects have, however, provided a reasoned consideration of, and insight into, the potentially significant Type 1 cumulative effects of the Proposed Development.

Identification of Likely Significant Type 1 Cumulative Effects

Construction Phase

- 15.20 As above, sensitive receptor groups are only considered further within the Type 1 cumulative effects assessment where an individual effect that is more than negligible has been identified within technical chapters 6 to 14.
- 15.21 On that basis, the following sensitive receptors have been excluded from the Type 1 cumulative effects assessment as individual effects upon them were categorised as being negligible:
- Known and potential (non-designated) buried archaeological remains
 - Grade II Listed Haigh Hall
 - Elements of the 'important' hedgerows within the site
 - Dum Wood & Dogloitch Wood
- 15.22 Based on the methodology detailed above, Table 16.1 presents the results of the review of the potential for interactions of individual effects during the construction phase of the Proposed Development. The potential effect interactions are then discussed further.

Table 16.1: Construction Phase Type 1 Cumulative Effects

Sensitive Receptor Group	Construction Phase Residual Effects Likely Significant Effects	Likely Type 1 Cumulative Effects
Local Residents	Minor adverse, short-term and temporary impact on air quality nuisance from dust deposit during construction. Minor adverse, short-term and temporary noise impacts on local residents. Moderate-major adverse temporary effect in relation to visual amenity.	Minor adverse, short-term and temporary cumulative impact on local residents in relation to air quality and noise during the construction phase. The effect is not considered to be significant in EIA terms.
Local Workforce	Moderate beneficial, short-term and temporary impact through the creation of new direct and indirect jobs.	There will be combined inter-project effects on this receptor during the construction phase, some of which will be beneficial, all short-term and temporary in nature. Overall, the cumulative effect is judged to be minor beneficial and therefore not considered to be significant in EIA terms.
Road users	Minor adverse effects due to the temporary addition of construction traffic.	No likely significant Type 1 cumulative effects.

- 15.23 Table 16.1 demonstrates that there is potential for inter-relationship Type 1 cumulative effects to arise during the construction phase; however, these are not expected to be significant in EIA terms and will be temporary and short term in duration.

- 15.24 Individual residual effects with the potential to give rise to a significant Type 1 cumulative effect are predominantly expected to relate to the interaction between temporary adverse construction (nuisance) impacts which are temporary and short term in duration.

Operational Phase

- 15.25 As above, where an effect on a sensitive receptor group is considered to be negligible these have not been considered further in the Type 1 cumulative effects. For the operational phase these receptors are:

- Dum Wood & Dogloitch Wood
- Grade II Listed Haigh Hall

- 15.26 Based on the methodology detailed above, Table 16.2 presents the results of the review of the potential for interactions of individual effects during the operational phase of the Proposed Development. The potential effect interactions are then discussed further.

Table 156.2: Operation Phase Type 1 Cumulative Effects

Sensitive Receptor Group	Operational Phase Residual Effects Likely Significant Effects	Likely Type 1 Cumulative Effects
Local Residents	Major beneficial and permanent, long-term improvements to the housing supply as well as minor beneficial improvements to crime, following measures to 'design out' crime, including increasing natural surveillance and active frontages around the Site, and it is expected that CCTV would also be included as part of the employment uses proposed. Minor adverse, long term, permanent, local and not significant impact with regard to air quality as a result of vehicle exhaust emissions.	No likely significant Type 1 cumulative effects.
Local Businesses and Economy	Moderate beneficial, permanent and long-term impact through the addition of further housing and consequent increase in expenditure and employment opportunities. Minor adverse for healthcare facilities, mitigated through additional provision if required. Furthermore the provision of open space and recreation space would have wider beneficial healthcare impacts.	No likely significant Type 1 cumulative effects.
Local Landscape	Moderate to major adverse on the sense of tranquillity and openness.	No likely significant Type 1 cumulative effects.

Sensitive Receptor Group	Operational Phase Residual Effects Likely Significant Effects	Likely Type 1 Cumulative Effects
	Minor adverse effect from the displacement of local breeding birds.	
Pedestrians and Cyclists	Minor long term beneficial effects for pedestrian movement and capacity, potential provision of new cycle routing and improvement to the PROW network.	No likely significant Type 1 cumulative effects.
Road Users	Minor long term beneficial effects following bus passenger uplift and improving junction capacity.	No likely significant Type 1 cumulative effects.

15.27 Table 16.2 demonstrates that there are no inter-relationship Type 1 Cumulative Effects during the operational phase of the Proposed Development.

Mitigation Measures

15.28 Where relevant, the individual residual effects which contribute to the identified Type 1 cumulative effects have been considered within the ES and mitigated where necessary and feasible. It is not considered that the Type 1 cumulative effects would be significant in EIA terms and therefore no further mitigation measures have been proposed.

16 Residual Effects

16.1 This chapter contains a summary of the residual effects of the Proposed Development.

Legislation, Policy and Guidance

Regulatory Requirement

16.2 The requirement for mitigation measures is specified in Schedule 4 paragraph 7 of the EIA Regulations, which states that Environmental Statements should include:

"A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases."

16.3 The approach to mitigation measures is also echoed in Directive 2011/92/EU as amended by Directive 2014/52/EU at Article 5(1) and at Annex IV.

Planning Policy

16.4 This chapter considers policy relating to the mitigation of impacts of the Proposed Development. It should be read in conjunction with technical Chapters 6 - 14, where planning policy at the national, regional, county and local level is discussed in greater detail for each topic.

16.5 Paragraph 32 of the National Planning Policy Framework (NPPF) also outlines a hierarchical approach to mitigating effects to be taken during the preparation of local plans whilst addressing economic, social and environmental objectives:

"Significant adverse impacts on these [economic, social and environmental] objectives should be avoided and, wherever possible, alternative options which reduce or eliminate such impacts should be pursued. Where significant adverse impacts are unavoidable, suitable mitigation measures should be proposed (or, where this is not possible, compensatory measures should be considered)."

Guidance

16.6 The Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Union, 2017) sets out that priority should be given to avoiding adverse impacts and with compensatory measures being considered only as a last resort.

Socio-Economic

Construction Phase

	Description	Pre-mitigation significance	Mitigation Method	Means of Implementation	Post-Mitigation Significance and Duration
Local Population	Changes in the local population	n/a	n/a	n/a	n/a
Housing	Changes in supply and requirements	n/a	n/a	n/a	n/a

	Description	Pre-mitigation significance	Mitigation Method	Means of Implementation	Post-Mitigation Significance and Duration
Employment	Changes in employment opportunities	Moderate beneficial	n/a	n/a	Moderate beneficial. The Site is anticipated to be constructed over 10-15 years.
Local Expenditure	Changes in local retail and leisure spending	Moderate beneficial	n/a	n/a	Moderate beneficial. The Site is anticipated to be constructed over 10-15 years.
Healthcare Facilities	Changes in demand for dental and GP facilities	n/a	n/a	n/a	n/a
Education	Changes in infrastructure to support student education	n/a	n/a	n/a	n/a
Open Space, Recreation and Amenity	Changes in supply of, and demand for, open space for public recreation and amenity	n/a	n/a	n/a	n/a
Crime	Changes in the occurrence of, and opportunities for criminal activity.	n/a	n/a	n/a	n/a

Operational Phase

	Description	Pre-mitigation significance	Mitigation Method	Means of Implementation	Post-Mitigation Significance and Duration
Local Population	Changes in the local population	Minor beneficial	n/a	n/a	Minor beneficial
Housing	Changes in supply and requirements	Major beneficial	n/a	n/a	Major beneficial
Employment	Changes in employment opportunities	Major beneficial	n/a	n/a	Major beneficial

Description		Pre-mitigation significance	Mitigation Method	Means of Implementation	Post-Mitigation Significance and Duration
Local Expenditure	Changes in local retail and leisure spending	Major beneficial	n/a	n/a	Major beneficial
Healthcare Facilities	Changes in demand for dental and GP facilities	Moderate adverse	Financial contributions through s.106 agreements	Discussion with Council during determination of the planning application	Minor adverse
Education	Changes in infrastructure to support education	Minor beneficial	n/a	n/a	Minor beneficial
Open Space, Recreation and Amenity	Changes in supply of, and demand for, open space for public recreation and amenity	Minor beneficial	n/a	n/a	Minor beneficial
Crime	Changes in the occurrence of, and opportunities for criminal activity.	Minor beneficial	n/a	n/a	Minor beneficial

Landscape and Visual Impact

Construction Phase

Likely Significant Effect	Mitigation method and means of implementation	Post-Mitigation Significance and Duration
Residents with close and mid-range views of the Site	Screening of site with temporary hoarding; managed working hours; controlled access points; considered location of stockpiles and equipment; considered location of temporary buildings/cabins, details of which will be contained within a CEMP.	Moderate-major adverse temporary effect

Operational Phase

Likely Significant Effect	Mitigation methods and means of implementation	Post-Mitigation Significance and Duration
Negligible effect on NCA 38	None	Negligible effect on NCA 38
Moderate-Major effect on LCA E8	Retention of existing Site assets where practicable including the vast majority of trees and hedgerows, and all PROW as illustrated on the Parameter plans.	Moderate-Major effect on LCA E8

Likely Significant Effect	Mitigation methods and means of implementation	Post-Mitigation Significance and Duration
Negligible effect on LCA Northern Coalfield	None	Negligible effect on LCA Northern Coalfield
Negligible effect on LCM 6	None	Negligible effect on LCM 6
Negligible effect on LCM 8	None	Negligible effect on LCM 8
Minor-moderate adverse effect on Settlement	Commercial buildings to be located within central, low parts of Site. Street orientation to run with existing contours where possible, pattern and grain of built form to complement surrounding residential areas and to also incorporate green infrastructure.	Minor-moderate adverse effect on Settlement
Moderate adverse effect on Topography	Minimal disruption to existing topography. Perceived changes minimised by incorporating green/blue infrastructure as required by the parameter plans.	Moderate adverse effects on Topography
Major adverse effect on Agricultural Land	None	Major adverse effect on Agricultural Land
Minor adverse effect on Hedgerows	Gapping up, relaying and positive management of hedgerows.	Minor beneficial effect on hedgerows
Minor-Moderate adverse effect on Trees	Retention and positive management of existing trees. Extensive planting of new trees within proposed greenspaces, street and around Site boundaries.	Moderate beneficial effect on Trees
Moderate adverse effect on Water Courses	As required by the parameter plans: Retention of existing watercourses. Addition of proposed SuDS features to form an integrated blue infrastructure proposal.	Moderate, beneficial
Moderate adverse effect on PROW	Retention of all PROW. Creation of additional connections within site. Planting along routes to mitigate against effects on amenity and character of routes.	Minor-moderate adverse effect on PROW
Major adverse effect on Sense of Tranquillity	Creation of quiet places within extensive green infrastructure proposals spanning the entire Site.	Moderate-Major adverse effect on Sense of Tranquillity
Major adverse effect on Sense of Openness	None	Major adverse effect on Sense of Openness
Moderate-Major adverse effects on view 1	Retention and positive management of existing hedgerows and trees, to provide screening. Additional tree planting within Site and to its boundaries. Extensive green/blue infrastructure across the whole Site to visual complement proposed built form.	Moderate-Major adverse effects of view 1
Major adverse effects on view 2	As above	Major adverse effects on view 2
Major adverse effects on view 3	As above	Moderate-Major adverse effects on view 3
Moderate-Major adverse effects on view 4	As above	Moderate adverse effects on view 4

Likely Significant Effect	Mitigation methods and means of implementation	Post-Mitigation Significance and Duration
Moderate adverse effects on view 5	As above	Moderate adverse effects on view 5
Moderate adverse effects on view 6	As above	Minor-Moderate adverse effects on view 6
Moderate adverse effects on view 7	As above	Moderate adverse effects on view 7
Moderate adverse effects on view 8	As above	Minor adverse effects on view 8
Major adverse effects on view 9	As above	Major adverse effects on view 9
Major adverse effects on view 10	As above	Major adverse effects on view 10
Major adverse effects on view 11	As above	Major adverse effects on view 11

Archaeology and Historic Environment

Construction Phase

Effect	Receptor	Mitigation Method	Residual Effect
Permanent disturbance or loss of potential buried archaeological remains (non-significant adverse effect) within the Site	Known and potential (non-designated) buried archaeological remains	Further investigation comprising trial trench evaluation and potentially excavation and recording to be secured by condition.	Non-significant adverse effect
Temporary construction activities in proximity to built heritage	Grade II Listed Haigh Hall	n/a	None
Permanent loss of parts of the 'important' hedgerows (non-significant adverse effect) within the Site	Elements of the 'important' hedgerows within the site	None	Non-significant adverse effect

Operational Phase

Effect	Receptor	Mitigation Method	Residual Effect
Change to the setting of heritage assets	Grade II listed Haigh Hall	None	Non-significant adverse effect

Noise and Vibration

Construction Phase

Description	Pre-mitigation significance	Mitigation	Residual Effect
Noise effects at high sensitive receptors during nearest construction works or high noise events e.g piling	Significant	Standard best practice measures via a CEMP.	Not significant.
Vibration effects at high sensitivity receptors during nearest construction works or high noise events e.g piling	Significant	Standard best practice measures.	Not significant.

Operational Phase

Description	Pre-mitigation significance	Mitigation	Residual Effect
Road traffic noise from existing roads impact on the high sensitive receptors	Not significant	No further mitigation required.	Not significant.
Road traffic noise from existing and proposed roads on the high sensitive receptors	Not significant	Planning conditions to ensure a good acoustic design.	Not significant.

Air Quality**Construction Phase**

Description	Receptor	Mitigation	Residual Effect
Annoyance due to dust soiling	Human Receptors	Standard best practice measures including communications, site management, monitoring, site preparation, sustainable travel, operations, waste management and earthworks which will be detailed within a CEMP.	Negligible, long term, temporary, local and not significant.
Health effects due to increased exposure to PM ₁₀	Human Receptors	Identified forms of mitigation include communications, site management, monitoring, site preparation, sustainable travel, operations, waste management and earthworks.	Negligible, long term, temporary, local and not significant.
Ecological effects due to dust deposition	Ecological Receptors	Identified forms of mitigation include communications, site management, monitoring, site preparation, sustainable travel, operations, waste management and earthworks.	Negligible, long term, temporary, local and not significant.

Operational Phase

Description	Receptor	Mitigation	Residual Effect
Increases in NO ₂ and PM ₁₀ concentrations as a result of vehicle exhaust emissions	Identified Sensitive Receptors	All Heavy Duty Vehicle (HDV) movements produced from the Proposed Development that travel towards Dewsbury Town Centre will be prevented from utilising the portion of Leeds Road included within Kirklees AQMA 5. A planning condition	Minor adverse, long term, permanent, local and not significant

		would require a dedicated route to be agreed.	
Exposure of future occupants to exceedences of the AQOs	Future Occupants	None required	Not significant

Flood Risk and Drainage

Construction Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Silt-laden Runoff	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Silt Management and Control measures to be included in the CEMP	Negligible Effect
Spillages, Leakages and Pollutants	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Measures to control the storage, handling and disposal of polluting substances during construction to be included in the CEMP	Negligible Effect
Mud and Debris Blockages	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	A temporary drainage network will be installed prior to the commencement of construction and a robust maintenance plan maintained throughout the duration of construction works on Site.	Negligible Effect
Temporary Increase in Impermeable Area	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Construction mitigation guidance should be adhered to, for example ensuring that site impermeability is increased as little as possible during construction, thereby lessening as the Proposed Development progresses and the overall impermeable area increases with surface water drainage networks installed to deal with this effect.	Negligible Effect

Operational Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Diffuse Pollution Contained in Urban Runoff	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Inclusion of a detention basin, pond and/or permeable paving should in general provide sufficient treatment. Where large areas of car parking are envisaged associated with	Negligible Effect

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
		commercial development, additional treatment may need to be provided by a suitably sized separator. Completion of a robust SuDS maintenance plan.	
Increase in Highway Routine Runoff	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	No mitigation required beyond what is proposed in Chapter 13 Transport	Negligible Effect
Increase in Highway Spillage Risk	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	No mitigation required beyond what is proposed in Chapter 13 Transport	Negligible Effect
Increased demand on Water Supply	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	No mitigation required	Negligible Effect
Disposal of Surface and Foul Water from the Site	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	No mitigation required	Negligible Effect
Increase in Permanent Impermeable Area	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Surface water attenuation through the SuDS management train will be provided by hydro-brake flow control devices (or similar) and surface water attenuation storage will be provided by retention basins; ponds; infiltration basins and other SuDS systems as suitable and determined during detailed design.	Negligible Effect
Increase in Discharge to Local Watercourses	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	Discharge to local watercourses, through the management train of a variety of SuDS components, will control the release of surface water at the Site so as not to exacerbate [surface water][flood] risk to the Site or downstream???	Negligible Effect

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Blockage of Drainage Networks	Surface Water (leaching into ground) Ordinary Watercourses A-C and Hey Beck	The drainage system will be designed to good practice standards and the implementation of a robust maintenance plan will aid in ensuring that the risk of flooding as a result of blockages is reduced.	Negligible Effect

Contamination**Construction Phase**

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Moderate adverse effect from the loss of soil / natural strata and minerals	Whole Site	Reuse of suitable materials (e.g. topsoil / subsoil) on site via a CEMP.	Negligible effect on soil / natural strata and minerals
Minor adverse effect of the introduction of additional contaminants into soil, surface and groundwater	Whole site	Preparation of a CEMP, adopt best practise for the handling of hazardous materials, use of bunded storage areas, restrict the maintenance of vehicles on site.	Negligible effect on soil, surface and groundwater
Moderate adverse effect of the introduction of silt and debris into surface watercourses from site runoff	Controlled Waters	Preparation of a CEMP, development of a construction phasing plan, adopt good stockpile control and minimise runoff as far as is practicable.	Negligible effect on surface watercourses
Minor adverse effect from excavation into potentially contaminated soil/groundwater	Construction workers	Safe systems of works and PPE.	Negligible effect on workers
Moderate adverse effect on construction workers as a result of excavations into and treatment of unrecorded unstable mining features	Construction workers	Site investigation and remedial treatment of any unstable ground.	Negligible effect on workers
Minor adverse effect on construction workers and site neighbours from the generation of dust during earthworks	Construction workers	Screening, sheeting, monitoring and damping down.	Negligible effect on workers

Operational Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Minor adverse effect of the introduction of additional contaminants into soil, surface and groundwater as a result of accidental spillages/leakage from vehicles	Whole site	Adopt best practise for the handling of hazardous materials, use of bunded storage areas, restrict the maintenance of vehicles on site. Fuel interceptors.	Negligible effect on soil, surface and groundwater
Minor to Major adverse effect of contamination	Whole site	Environmental Management Systems.	Negligible effect on soil, surface and groundwater

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
into soil, surface and groundwater as a result of accidental spillages/leakage from the storage of raw materials, bulk fuels and liquids within the employment zone			
Minor adverse effect of degradation of building materials and buried services over time as a result of contact with sulphate within soils and low pH	Buried concrete and water supply pipe	Specification of appropriate materials.	Negligible effect on buried concrete and services
Moderate adverse effect on buildings and substructures as a result of unstable ground (mining features, shafts, shallow workings etc)	Building structures	Site investigation and remedial treatment of any unstable ground.	Negligible effect on building structures
Major adverse effect on future site occupiers as a result of hazardous ground gas	Site occupiers	Site investigation, monitoring and gas protection systems.	Negligible effect on site occupiers

Transport

Construction Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Construction traffic: Additional traffic due to construction	Road users, Local residents	Construction Management Plan	Minor medium-term adverse

Operational Phase

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Pedestrian movement and capacity: Upgrade of existing PROW network	Pedestrians	N/A	Minor long-term beneficial
Pedestrian Severance: Additional vehicle traffic	Pedestrians	Improved crossing on Chidswell Lane as a part of Site Access 4	Negligible

Likely Significant Effect	Receptor(s)	Mitigation Measure	Residual Effect
Cycling Facilities: New cycle routing potential and improved PROW network accessibility	Cyclists	N/A	Minor long-term beneficial
Public Transport: Bus network passenger uplift	Bus passengers	N/A	Minor long-term beneficial
Junction Capacity and Driver Delay	Road users	Financial contributions to local junction improvements through s106 agreement	Minor long-term adverse

Ecology

Construction Phase

Effect	Receptors	Mitigation Measure	Residual Effect
Minor indirect effects from disturbance/ damage of retained habitats	Dum Wood & Dogloitch Wood Hedgerows Watercourse	Production of a CEMP which will detail: - Appointing an ECoW - Incorporating Tool-box talk into Site inductions - Good Housekeeping - Installing Barrier Fencing	Negligible effects from indirect damage and disturbance
Minor/ moderate negative effect from habitat loss	Hedgerows Watercourse	Production of a BMP which will detail habitat creation	Minor Positive Impact from Habitat Creation
Major negative effect from displacement of breeding birds	Breeding birds	Production of a BMP which will detail new foraging/ nesting opportunities for birds.	Major negative effect from displacement of current breeding bird assemblage
Moderate negative effect from spread of INNS	Invasive Non-Native Species (INNS)	Production of an Invasive Weed Management Plan.	Minor Positive effect from control/ removal of INNS from Site.

Operational Phase

Effect	Receptors	Mitigation Measure	Residual Effect
Major negative impact on woodland habitat from increased human activity	Dum Wood & Dogloitch Wood	Scope of the BMP will be widened to take in these two woodlands, or a separate Woodland Management Plan will be produced to	Negligible impact on woodland from increased human pressure.

Effect	Receptors	Mitigation Measure	Residual Effect
		manage impacts on these habitats.	
Minor/ moderate negative impact from inappropriate management of priority habitats	Hedgerows Watercourse	Production of a BMP which will detail long term management of new and retained habitats	Moderate positive effect on new and retained habitats from 'wildlife friendly' management
Moderate negative impact from disturbance of local breeding bird assemblages	Breeding birds	Production of a BMP which will detail new foraging/ nesting opportunities for birds.	Minor negative effect from displacement of local breeding bird assemblage
Moderate negative effect from spread of INNS	Invasive Non-Native Species	Production of an Invasive Weed Management Plan.	Minor Positive effect from control/ removal of INNS from Site.

Deloitte.

Real Estate

This report has been prepared for the C.C. Projects, a subsidiary company of the Church Commissioners for England, and on the understanding that it will be made publically available.

All copyright and other proprietary rights in the report remain the property of Deloitte LLP and Re-form; Delta Simons; Patrick Parsons; Brooks Ecological; Pell Frischmann; and Cotswold Archaeology ("the Consultants") and any rights not expressly granted in these terms or in the contract between Deloitte LLP and the C.C. Projects are reserved.

No party other than C.C. Projects is entitled to rely on the report for any purpose whatsoever and thus Deloitte LLP and the Consultants accept no liability to any other party who is shown or gains access to this document.

The information contained within this report is provided to assist C.C. Projects with this Application for Outline Planning Permission. The report makes use of a range of third party data sources. Whilst every reasonable care has been taken in compiling this report, Deloitte LLP and the Consultants cannot guarantee its accuracy.

Deloitte LLP is a limited liability partnership registered in England and Wales with registered number OC303675 and its registered office at 1 New Street Square, London EC4A 3HQ, United Kingdom.

Deloitte LLP is the United Kingdom affiliate of Deloitte NSE LLP, a member firm of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"). DTTL and each of its member firms are legally separate and independent entities. DTTL and Deloitte NSE LLP do not provide services to clients. [Please click here learn more about our global network of member firms.](#)