



Proposed Development at Hollingworth Road and Rakewood Road, Littleborough

Environmental Statement

Volume 2: Hollingworth Road Land Parcel

On behalf of **Bloor Homes North West**



Project Ref: 332010570 Date: June 2024

Registered Office: Buckingham Court Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire, HP11 1JU
Office Address: 100 Barbirolli Square, Manchester, M2 3PW
T: +44 (0)161 245 8900 E: Manchester.uk@stantec.com

Document Control Sheet

Project Name: Proposed Development at Hollingworth Road and Rakewood Road,
Littleborough

Project Ref: 332010570

Report Title: Environmental Statement – Volume 2: Hollingworth Road Land Parcel

Doc Ref: 332010570/ ES Vol.2

Date: June 2024

	Name	Position	Signature	Date
Prepared by:	Nicole Beckett /Various Technical Consultants	Senior Environmental Planner/ Various Technical Consultants	<i>N.Beckett</i>	June 2024
Reviewed By	Bernard Greep	Director	<i>B.Greep</i>	June 2024
Approved by:	Bernard Greep	Director	<i>B.Greep</i>	June 2024
For and on behalf of Stantec UK Limited				

Revision	Date	Description	Prepared	Reviewed	Approved
Rev A	05.07.24	Updates	BT	BG	BG

This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

Contents

1	Introduction.....	1
1.1	Purpose	1
1.2	Terms and Definitions	1
2	Ecology and Biodiversity	3
2.1	Introduction	3
2.2	Policy Context, Legislation, Guidance and Standards	3
2.3	Consultation.....	10
2.4	Assessment Methodology and Significance Criteria	11
2.5	Baseline Conditions.....	14
2.6	Primary and Tertiary Mitigation	23
2.7	Further Mitigation and Enhancement	35
2.8	Likely Residual Effects of the Development and their Significance	42
2.9	Assessment of Cumulative Effects and their Significance	49
2.10	Summary	49
2.11	References	50
3	Landscape and Visual.....	52
3.1	Introduction	52
3.2	Policy Context, Legislation, Guidance and Standards	53
3.3	Assessment Methodology	58
3.4	Consultation.....	59
3.5	Baseline Conditions.....	59
3.6	Landscape Character	62
3.7	Design / Strategy	75
3.8	Assessment of Likely Effects.....	76
3.9	Mitigation Measures	81
3.10	Residual Effects (Year 15)	82
3.11	Cumulative Effects.....	84
3.12	Summary	85
3.13	References	87
4	Hydrology and Drainage.....	89
4.1	Introduction	89
4.2	Legislation, Policy, Guidance and Standards.....	89
4.3	Consultation.....	91
4.4	Methodology	92
4.5	Baseline Conditions.....	95
4.6	Primary and Tertiary Mitigation	97
4.7	Assessment of Likely Effects.....	100
4.8	Secondary Mitigation and Enhancement	105
4.9	Residual Effects.....	105

4.10	Cumulative Effects.....	108
4.11	Summary	108
4.12	References	109
5	Ground Conditions	111
5.1	Introduction	111
5.2	Policy Context, Legislation, Guidance and Standards	111
5.3	Methodology	112
5.4	Baseline Conditions	119
5.5	Primary and Tertiary Mitigation	127
5.6	Assessment of Significant Likely Effects	128
5.7	Secondary Mitigation and Enhancement	130
5.8	Residual Effects.....	131
5.9	Cumulative Effects.....	131
5.10	Monitoring.....	132
5.11	Consideration of Climate Change	132
5.12	Conclusions	133
5.13	References	134
6	Historic Environment	136
6.1	Introduction	136
6.2	Policy Context, Legislation, Guidance and Standards	136
6.3	Consultation.....	137
6.4	Methodology	138
6.5	Baseline Conditions	143
6.6	Primary and Tertiary Mitigation	148
6.7	Assessment of Significant Likely Effects	149
6.8	Secondary Mitigation and Enhancement	149
6.9	Residual Effects.....	150
6.10	Cumulative Effects.....	151
6.11	Consideration of Climate Change	151
6.12	Conclusions	151
6.13	References	152
7	Traffic and Transport	154
7.1	Introduction	154
7.2	Policy Context, Legislation, Guidance and Standards	154
7.3	Consultation.....	156
7.4	Methodology	157
7.5	Baseline Conditions	167
7.6	Primary and Tertiary Mitigation	181
7.7	Assessment of Significant Likely Effects	182
7.8	Secondary Mitigation and Enhancement	190
7.9	Residual Effects.....	191

	7.10	Cumulative Effects.....	191
	7.11	Monitoring.....	191
	7.12	Consideration of Climate Change	192
	7.13	Conclusions	192
	7.14	References	194
8		Air Quality	195
	8.1	Introduction	195
	8.2	Legislation, Policy Context, Guidance and Standards	195
	8.3	Consultation.....	196
	8.4	Methodology	197
	8.5	Baseline Conditions.....	202
	8.6	Primary and Tertiary Mitigation	207
	8.7	Assessment of Significant Likely Effects	210
	8.8	Secondary Mitigation and Enhancement	215
	8.9	Residual Effects.....	215
	8.10	Consideration of Climate Change	215
	8.11	Conclusions	215
	8.12	References	216
9		Noise and Vibration.....	219
	9.1	Introduction	219
	9.2	Policy Context, Legislation, Guidance and Standards	219
	9.3	Consultation.....	222
	9.4	Methodology	222
	9.5	Baseline Conditions.....	232
	9.6	Primary and Tertiary Mitigation	233
	9.7	Assessment of Significant Likely Effects	234
	9.8	Vibration	239
	9.9	Secondary Mitigation and Enhancement	239
	9.10	Residual Effects.....	240
	9.11	Cumulative Effects.....	240
	9.12	Monitoring	240
	9.13	Consideration of Climate Change	241
	9.14	Conclusions	241
	9.15	References	242
10		Socio-Economics	244
	10.1	Introduction	244
	10.2	Policy Context, Legislation, Guidance and Standards	244
	10.3	Consultation.....	247
	10.4	Methodology	248
	10.5	Future baseline.....	267
	10.6	Primary and Tertiary Mitigation	267

10.7	Assessment of potential effects.....	267
10.8	Secondary Mitigation and Enhancement	270
10.9	Cumulative effects	270
10.10	Monitoring	271
10.11	Consideration of Climate Change	271
10.12	Conclusions	271
11	Climate Change	273
11.1	Introduction	273
11.2	Policy Context, Legislation, Guidance and Standards	273
11.3	Consultation.....	275
11.4	Methodology	276
11.5	Baseline Conditions.....	280
11.6	Primary and Tertiary Mitigation	283
11.7	Assessment of Likely Effects.....	285
11.8	Secondary Mitigation and Enhancement	287
11.9	Residual Effects.....	288
11.10	Cumulative Effects.....	288
11.11	Monitoring	288
11.12	Conclusions	289
11.13	Climate Change Risk Assessment.....	290

Figures

Figure 2.1 Hollingworth Road land parcel boundary and wider context (© Google Aerial Imagery)	11
Figure 10.1 Proportion of Population by Age Band	256
Figure 10.3 Percentage of all employment by occupation	266

Tables

Table 2.1 Ecological Consultation Undertaken	10
Table 2.2 Identification of Ecological Features	19
Table 2.3 Demolition and construction phase impacts on ecological resources within the Zol	24
Table 2.4 Potential impacts during the operational phase in the absence of secondary mitigation.	30
Table 2.5 Likely Residual Effects of the Proposed Development and their Significance	42
Table 3.1 Landscape Receptors	72
Table 3.2 Visual Receptors	75
Table 4.1 Defining Sensitivity of Receptor	93
Table 4.2 Defining Magnitude of Change	93
Table 4.3 Defining Duration of Effect	94
Table 4.4 Matrix for Assessing Significance of Effect	94
Table 4.5 Summary of Assessment of Significance of Effects	103
Table 4.6 Summary of Residual Effects	106
Table 5.1 Summary of Scoping Opinion Comments and Stantec's Responses	114
Table 5.2 Criteria Used in Ground Conditions for Classifying Receptor Sensitivity	116
Table 5.3 Criteria Used in Ground Conditions for Impact Magnitude (Change)	118
Table 5.4 Significance Matrix	119
Table 5.5 Summary of Off-site Source of Potential Contamination and the associated Contaminants of Potential Concern	125
Table 6.1 Criteria for grading the value (or sensitivity) of cultural heritage assets	139
Table 6.2 Magnitude of impact and typical descriptions	141
Table 6.3 Significance of effect matrix	142
Table 7.1 Summary of Consultation	156
Table 7.2 Fear and Intimidation Degree of Hazard	161
Table 7.3 Matrix of Sensitivity of Receptors for the Consideration of Environmental Effects	163
Table 7.4 Magnitude of Impacts	164
Table 7.5 Matrix of Significance for the Consideration of Environmental Effects	166
Table 7.6 Baseline (2022) Traffic Flows	169
Table 7.7 Baseline (2022) Highway Safety iRAP Calculations	171
Table 7.8 Baseline (2022) Degree of Hazard Calculations	173
Table 7.9 Cumulative Developments informing Baseline Evolution	175
Table 7.10 Future Year (No Development) Traffic Flows	176
Table 7.11 Future Year (No Development) Highway Safety iRAP Calculations	177
Table 7.12 Future Year (No Development) Degree of Hazard Calculations	179
Table 7.13 Future Year (With Development) Traffic Flows	183
Table 7.14 Future Year (With Development) Traffic Flows – Percentage Impact	184
Table 7.15 Future Year (With and Without Development) Driver and Passenger Delay Comparison	187
Table 7.16 Future Year (With and Without Development) Highway Safety iRAP Comparison	188
Table 7.17 Future Year (With and Without Development) Degree of Hazard Comparison	189
Table 8.1 Impact Significance Criteria	201
Table 8.2 Measured Annual Mean NO2 Concentrations 2018-2022	204
Table 8.3 Measured Exceedances of the Hourly Mean NO2 Objective 2018-2022	205
Table 8.4 Measured Annual Mean PM10 Concentrations 2018-2022	205
Table 8.5 Measured Daily Mean PM10 Concentrations 2018-2022	205
Table 8.6 Measured PM2.5 Concentrations 2018 – 2022	205
Table 8.7 Estimated Annual Mean Background Concentrations	206
Table 8.8 Construction Phase Mitigation Measures	208
Table 8.9 Dust Emissions Magnitudes	211
Table 8.10 Risk of Construction Dust Impacts without Mitigation	212
Table 8.11 Predicted Concentrations within the Hollingworth Road land parcel	213

Table 9.1 Summary of Consultation	222
Table 9.2 Descriptions of Noise Sensitive Receptors	223
Table 9.3 Description of Measurement Locations	225
Table 9.4 Meteorological Conditions	225
Table 9.5 Dominant Noise Sources	226
Table 9.6 Noise Exposure Hierarchy and Effect Levels	226
Table 9.7 Threshold of Potential Significant Effect at Dwellings	228
Table 9.8 Construction Noise Impact Levels for Residential Buildings	228
Table 9.9 Construction Vibration Impact Levels	229
Table 9.10 Transient Vibration Guide Values for Cosmetic Damage	229
Table 9.11 Internal and External Noise Criteria for Habitable Rooms Due to Transportation Noise ..	230
Table 9.12 Proposed Internal Ambient Noise Criteria – Overheating Condition	230
Table 9.13 Proposed Vibration Assessment Criteria	231
Table 9.14 Magnitude of Change in Noise Terms	231
Table 9.15 School LOAEL and SOAEL Criteria	231
Table 9.16 Summary of Environmental Sound Survey Results	232
Table 9.17 Vibration Survey Results	233
Table 9.18 Ambient Sound Levels at Receptors	235
Table 9.19 Construction Noise Levels	235
Table 9.20 Assessment of Impact for Construction Activity Noise	236
Table 9.21 Road Traffic Impacts	238
Table 10.1 Summary of chapter scope	248
Table 10.2 Labour market sensitivity	252
Table 10.3 Magnitude of Change Criteria	253
Table 10.4 Significance matrix	254
Table 10.5 Household Accommodation Types	255
Table 10.6 Tenure (Housing Study Area)	255
Table 10.7 Population Projections	256
Table 10.8 Nursery School Capacity	257
Table 10.9 Primary School Capacity	258
Table 10.10 Secondary School Capacity	259
Table 10.11 Healthcare provision	260
Table 10.12 Dentistry Provision	261
Table 10.13 Key Public Open Space within 1km of the Hollingworth Road land parcel	264
Table 10.14 Economic Activity and Inactivity	264
Table 10.15 Industry of Employment (Percentages)	265
Table 10.16 GVA Per Job Filled	266
Table 10.17 Annual Survey of Hours and Earnings	267
Table 10.18 Construction Additionality Assumptions	268
Table 10.19 Child Yield from the proposed development	269
Table 11.1 GHG Emissions Sources and Qualitative Scope	277
Table 11.2 GHG Significance (IEMA, 2022)	279
Table 11.3 UK Carbon Budget (2008-2022)	280
Table 11.4 National and Local (Rochdale) CO ₂ e estimates for 2021	281
Table 11.5 UK Carbon Budget Targets (2018-2037)	282
Table 11.7 Receptor Sensitivity	294
Table 11.8 50th Percentile Climate Projections at 25 km grid square (387500, 412500) using 1981- 2000 scenario RCP 8.5	296
Table 11.9 Climate Change Risk Assessment	300

1 Introduction

1.1 Purpose

1.1.1 This Environmental Statement ('ES') has been prepared by Stantec UK Limited ('Stantec') on behalf of Bloor Homes North West ('the Applicant') in relation to a hybrid planning application for the construction of 312 residential dwellings and a primary school at land to the west of Hollingworth Road and the reconfiguration of and extension to the existing car park at land to the east of Rakewood Road in Littleborough (the 'Proposed Development').

1.1.2 The description of development is as follows:

'Planning application seeking full permission for residential development including the construction of vehicular/pedestrian accesses, landscaping, open space and associated works at land off Hollingworth Road, alongside reconfiguration of and extension to the existing car park and associated works off Rakewood Road; and outline permission for the development of a primary school (access into the school site to be considered – all other matters reserved for future approval).'

1.1.3 The Site is located within the administrative boundary of Rochdale Borough Council ('RBC'). The Hollingworth Road land parcel is identified as residential allocation ('Policy JP Allocation 20: Land North of Smithy Bridge') in the Places for Everyone ('Pfe') document, which took effect and became part of the statutory development plan in March 2024.

1.1.4 Please refer to Volume 1 of this ES for details on the Site and Surrounding Area (Volume 1: Chapter 2), the Proposed Development (Volume 1: Chapter 3), the EIA assessment methodology (Volume 1: Chapter 6) and an overview of the Planning Policy and Context (Volume 1: Chapter 7).

1.1.5 Volume 2 of the ES comprises the technical assessments of the potential environmental effects of the Proposed Development at the Hollingworth Road land parcel. The technical appendices contain the topic specific survey work or technical detail supporting the individual assessments, along with key documents to support the main report and can be found in Volume 3 for the Hollingworth Road land parcel.

1.1.6 Please refer to Volume 4 for the technical assessments of the potential environment effects of the Proposed Development at the Rakewood Road land parcel.

1.2 Terms and Definitions

1.2.1 For ease of reference the following terms have been used throughout the ES (unless the context dictates otherwise):

- 'the Site' – land proposed for the Proposed Development (the extent of which is shown on the Site Location Plan within **Volume 1: Appendix A**) and which lies within the JPA 20 Allocation area:
 - 'the Hollingworth Road land parcel' – land at Hollingworth Road located to the immediate west of B6225 Hollingworth Road, north of Smithy Bridge and south-west of Littleborough, in the north-eastern part of Rochdale, Greater Manchester; and
 - 'the Rakewood Road land parcel' – land located off Rakewood Road, proposed to accommodate the proposed extension to the Hollingworth Lake Country Park car park.
- 'Proposed Development' – the application for which planning permission is being sought, as described in **Volume 1: Chapter 3**;

- 'the Applicant' – Bloor Homes North West;
- 'Illustrative Masterplan' – an indicative view of how the scheme could look. This is included in **Volume 1: Appendix B**;
- 'Parameter Plans' – plans for approval that establish parameters for the outline element of the proposed development (primary school). These are included in Appendix C 'RBC' (RBC is the determining authority);
- 'GMCA' – Greater Manchester Combined Authority, responsible for strategic spatial planning across Greater Manchester, is a statutory consultee for this application;
- 'Primary mitigation' – modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken;
- 'Secondary mitigation' – actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning permission;
- 'Tertiary mitigation' – actions that would occur with or without input from the EIA feeding into the design process, including actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.
- 'Impact' – in relation to the outcome of the project (such as removal of habitat); and
- 'Effect' – the consequent implication in environment terms.

1.2.2 A full glossary of terms and definitions is provided within **Volume 1: Chapter 12** of the ES.

2 Ecology and Biodiversity

2.1 Introduction

- 2.1.1 This chapter assesses the effects of the Proposed Development on ecology and nature conservation. In particular, it considers effects that may arise as a result of the Proposed Development on ecological features.
- 2.1.2 The chapter describes the methods used to assess the likely significant effects, the baseline conditions currently existing at the Hollingworth Road land parcel and its surroundings, the potential direct and indirect effects of the Proposed Development arising from the loss or disturbance to habitats, protected and priority species and designated sites; and the mitigation measures required to prevent, reduce, or offset the identified significant effects and the residual effects. The chapter has been written by Tyler Grange and the assessment is based on desk study information and ecological surveys undertaken in 2018, 2019, 2021 and 2022.
- 2.1.3 Details of the surveys carried out by Tyler Grange are provided in the respective Appendices for each species (see **Volume 3: Appendix A** of this ES), as follows:
- [Confidential] Badger *Meles meles* survey (**Volume 3: Appendix A.1**);
 - Bat Survey Results (**Volume 3: Appendix A.2**);
 - Bird Survey Results (**Volume 3: Appendix A.3**);
 - Extended Phase One habitat survey (**Volume 3: Appendix A.4**);
 - Great Crested Newt *Triturus cristatus* (**Volume 3: Appendix A.5**); and
 - Otter *Lutra lutra* and Water vole *Arvicola amphibius* survey (**Volume 3: Appendix A.6**).
- 2.1.4 This chapter and appendices are supported by the following figures which are provided in the **Volume 3: Appendix A.7**
- 11833_P18 – Figure 1.1.1 CONFIDENTIAL Badger Sett Location
 - 11833_P20 – Figure 1.2.1 Bat Emergence Results
 - 11833_P21 – Figure 1.2.2 Bat Activity Survey Results
 - 11833_P22 – Figure 1.3.1 Breeding Bird Survey Results
 - 11833_P23 – Figure 1.4.1 Habitat Features Plan
 - 11833_P24 – Figure 1.5.1 Pond Location Plan

2.2 Policy Context, Legislation, Guidance and Standards

National Planning Policy Framework (NPPF), December 2023

- 2.2.1 The National Planning Policy Framework ('NPPF') was last updated in December 2023 and sets out the Government's planning policies for England and how they should be applied. Paragraph 11 states that:

"Plans and decisions should apply a presumption in favour of sustainable development."

- 2.2.2 Section 15 of the NPPF (paragraphs 180 to 188) considers the conservation and enhancement of the natural environment including habitats and biodiversity (paragraphs 185-188). Paragraph 180 states that planning and decisions should contribute to and enhance the natural and local environment by:

“protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

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”

- 2.2.3 Paragraph 181 states that plans should:

“distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value; 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.”

- 2.2.4 Paragraph 185 states:

“to protect and enhance biodiversity and geodiversity, plans should:

- a) 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*
- b) 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.”*

- 2.2.5 When determining planning applications, Paragraph 186 states that local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- a) “if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the Site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and*

- d) *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.”*

2.2.6 Paragraph 187 advises that the following should be given the same protection as habitats sites:

- e) *“potential Special Protection Areas and possible Special Areas of Conservation;*
f) *listed or proposed Ramsar sites; and*
g) *sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.”*

2.2.7 Paragraph 188 states that the *“presumption in favour of sustainable development does not apply where the planned project is likely to have a significant effect on a habitat site (alone or in combination with other plans or projects) unless an appropriate assessment has concluded the plan or project will not adversely affect the integrity of the habitats site.”*

Legislation

2.2.8 Specific habitats and species receive legal protection in the UK under various legislation, namely:

- The Conservation of Habitats and Species and Planning (England and Wales) Regulations 2018 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);
- The Countryside and Rights of Way Act 2000;
- The Protection of Badgers Act 1992;
- The Natural Environment and Rural Communities Act 2006;
- The Hedgerows Regulations 1997; and
- The Wild Mammals (Protection) Act 1996.

The Conservation of Habitats and Species Regulations (CHSR) 2018 (as amended)

2.2.9 The European Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, 1992, often referred to as the 'Habitats Directive', provides for the protection of key habitats and species considered of European importance. Annexes II and IV of the Directive list all species considered of community interest. The legal framework to protect the species covered by the Habitats Directive has been enacted under UK law through The Conservation of Habitats and Species Regulations 2018.

The Wildlife and Countryside Act (WCA) 1981 (as amended)

2.2.10 In Britain, the WCA 1981 (as amended) is the primary legislation protecting habitats and species. Sites of Special Scientific Interest (SSSIs), representing the best examples of our natural heritage, are notified under the WCA 1981 (as amended) because of their flora, fauna, geology or other features. All breeding birds, their nests, eggs and young are protected under

the Act, which makes it illegal to knowingly destroy or disturb the nest site during nesting season. Schedules 1, 5 and 8 afford protection to individual birds, other animals and plants.

The Countryside and Rights of Way Act (CROW) 2000

- 2.2.11 The CROW Act 2000 strengthens the species enforcement provisions of the WCA 1981 (as amended) and makes it an offence to 'recklessly' disturb a protected animal whilst it is using a place of rest or shelter or breeding/nest site.

The Natural Environment and Rural Communities (NERC) Act 2006

- 2.2.12 The UK Post-2010 Biodiversity Framework succeeded the UK BAP partnership in 2011 and covers the period 2011 to 2020. However, the lists of Priority Species and Habitats agreed under the UK BAP still form the basis of much biodiversity work in the UK. The current strategy for England is 'Biodiversity 2020: A Strategy for England's wildlife and ecosystem services' published under the UK Post-2010 UK Biodiversity Framework. Although the UK BAP has been succeeded, Species Action Plans (SAPs) developed for the UK BAP remain valuable resources for background information on priority species under the UK Post-2010 Biodiversity Framework. Priority Species and Habitats identified under the UK BAP are also referred to as Species and Habitats of Principal Importance for the conservation of biodiversity in England within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

The Protection of Badgers Act (PBA) 1992

- 2.2.13 The following are criminal offences (unless permitted by the PBA):

- Damaging a badger sett or any part of it;
- Destroying a badger sett;
- Obstructing access to, or any entrance of, a badger sett;
- Causing a dog to enter a badger sett; and
- Disturbing a badger when it is occupying a badger sett.

- 2.2.14 A criminal offence is committed if a person carries out one of these acts intentionally or is reckless as to whether their actions would have any of these consequences.

- 2.2.15 Where relevant, this assessment takes account of this legislative protection.

Any Other Relevant National Planning or Development Strategies

- 2.2.16 The National Planning Policy Framework (NPPF) (Section 15, Paragraph 180) requires the planning system to aim to "contribute to and enhance the natural environment by: minimising impacts on and providing net gains for biodiversity, by establishing coherent ecological networks that are more resilient to current and future pressures minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures". Section 15, Paragraph 185 of the revised NPPF also promotes development to "identify and pursue opportunities for securing measurable net gains for biodiversity".
- 2.2.17 In England, biodiversity net gain is required under a statutory framework introduced by Schedule 7A of the Town and Country Planning Act 1990 (inserted by the Environment Act 2021). This statutory framework is referred to as 'biodiversity net gain' in Planning Practice Guidance to distinguish it from other or more general biodiversity gains

Local Planning Policy

2.2.18 The Site falls within the administrative borough of Rochdale Borough Council (RBC). The Core Strategy for Rochdale borough, which was adopted on 19 October 2016¹, includes some policies that have been wholly or partially replaced by policies within the recently adopted Places for Everyone ('PfE') Plan. For instance, of relevance to the Proposed Development, Table A.5 within Appendix A to the PfE Plan confirms that:

- Rochdale Core Strategy Policy C1 ('Delivering the right amount of homes in the right places'), and specifically the requirement 'to deliver at least 460 net additional dwellings per year up to 2028', is superseded by PfE Policy JP-H1 ('Scale, Distribution and Phasing of New Housing Development').
- Rochdale Core Strategy Policy G4 ('Protecting Green Belt land') is superseded by PfE Policy JP-G9 ('The Green Belt').
- Rochdale Core Strategy Policy G5 ('Managing protected open land') is also superseded by PfE Policy JP-G9 ('The Green Belt'). Table A.5 contains the following note regarding the section of Core Strategy Policy C5 that is superseded: *'Need to remove the references to existing areas of POL in the policy that are changing as a result of allocations or land going into the Green Belt.'*

2.2.19 The Hollingworth Road land parcel is no longer within the Green Belt and so the Rochdale Proposals Map has been superseded in that regard because it has been removed from the Green Belt and is now allocated for around 300 new homes and a new primary school by 'Policy JP Allocation 20: Land North of Smithy Bridge' within PfE.

2.2.20 Table 3 within Appendix 3 to the Rochdale Core Strategy refers to various UDP policies which have been 'saved'. One of the saved UDP Policies is G/8 ('Greenspace Corridors'), but that is not one of the policies listed within Table A.5 of Appendix A to the PfE Plan. On that basis we assume that the north-western part of the Hollingworth Road land parcel is still covered by the Greenspace Corridor (Policy G/8) designation.

2.2.21 The following policies in the Rochdale Core Strategy are relevant to ecology at the Hollingworth Road land parcel:

- Policy G6 – Enhancing Green Infrastructure: *"We will sustain and enhance a green network to support growth and regeneration in the borough and provide a high quality environment that meets the needs of our community and visitors to the borough. We will protect and improve green spaces and water bodies and ensure that their value to sustainable development and regeneration is maximised. Our priorities are to improve opportunities for recreation in urban areas and the countryside, improve opportunities for healthy lifestyles, and to help manage and respond to environmental risks such as flooding and the impacts of climate change".*
- Policy G7 – Increasing the value of biodiversity and geodiversity: *"We will ensure that sites and features of biodiversity and geodiversity importance are given full and appropriate recognition and protection. Opportunities for enhancing biodiversity and geodiversity, creating new sites and features of interest and improving opportunities for public enjoyment will be supported".*

2.2.22 For completeness, we also highlight the following policies from PfE:

- Policy GM-S 1, Sustainable Development: *"Development should aim to maximise its economic, social and environmental benefits simultaneously, minimise its adverse*

¹Rochdale Adopted Core Strategy: <https://www.rochdale.gov.uk/downloads/file/405/core-strategy>

impacts and actively seek opportunities to secure net gains across each of the different objectives”.

- Policy GM-S 5, Floor Risk and Water Environment: Although the majority of this policy is more relevant to Floor Risk Management, a key element of this ecological assessment relates to the potential impacts of run-off and drainage into the Rochdale Canal SAC adjacent to the Hollingworth Road land parcel; the relevant information is ... *“Expecting developments to manage surface water runoff through sustainable drainage systems and as close to source as possible (unless demonstrably inappropriate) so as to not exceed greenfield run-off rates or alternative rates specified in district local plans.”*

- Policy GM-G 2, Green Infrastructure Network: *“The network of green infrastructure that stretches throughout Greater Manchester will be designed, managed, protected and enhanced so as to help deliver the following critical benefits”. The points relevant to ecology are:*

“Enhance biodiversity, by expanding, improving and connecting habitats”

“Enable people to connect with nature at a local level”

- Policy GM-G 3, River Valleys and Waterways: *“River valleys and waterways will be protected and improved as central components of Greater Manchester’s green infrastructure network, making a major contribution to local identity, quality of life and the natural environment”.*
- Policy GM-G 7, Trees and Woodland: *“In making planning decisions and carrying out other associated activities, Greater Manchester’s authorities will work to deliver the aims and objectives of the Greater Manchester Tree and Woodland Strategy, aiming to significantly increase tree cover, protect and enhance woodland, and connect people to the trees and woodland around them”.*
- Policy GM-G 9, Standards for a Greener Greater Manchester: *“Access to natural green space, which seek to maximise the overall proportion of people across Greater Manchester who have access to natural green space”.*

- Policy GM-G 10, A Net Enhancement of Biodiversity and Geodiversity:

- Increasing the quality, quantity, extent and diversity of habitats, particularly priority habitats identified in national or local biodiversity action plans and those that support priority species;
- Improving connections between habitats;
- Enhancing the management of existing habitats;
- Protecting sites designated for their nature conservation and/or geological importance;
- Facilitating greater access to nature, particularly within urban areas;
- Encouraging the use of native species in habitat creation and landscaping schemes;
- Supporting the implementation of the Greater Manchester Wetlands Nature Improvement Area, and;
- Safeguarding, restoring and sustainably managing Greater Manchester’s most valuable soil resources.

- Policy GM-G 11, Greater Manchester Green Belt: “*The Greater Manchester Green Belt will be afforded strong protection in accordance with the National Planning Policy Framework.*”

National Biodiversity Action Plans

- 2.2.23 The UK Post-2010 Biodiversity Framework succeeded the UK BAP partnership in 2011 and covers the period 2011 to 2020, but the lists of Priority Species and Habitats agreed under the UK BAP still form the basis of much biodiversity work in the UK. The current strategy for England is 'Biodiversity 2020: A Strategy for England's wildlife and ecosystem services', published under the UK Post-2010 UK Biodiversity Framework. Although the UK BAP has been succeeded, Species Action Plans (SAPs) developed for the UK BAP remain valuable resources for background information on priority species under the UK Post-2010 Biodiversity Framework.
- 2.2.24 Priority Species and Habitats identified under the UK BAP are also referred to as Species and Habitats of Principal Importance for the conservation of biodiversity in England and Wales within Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006. The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.

Local Biodiversity Action Plans

- 2.2.25 The Greater Manchester Biodiversity Action plan ('GM BAP')² aims to provide an over-arching document across all ten districts in Greater Manchester; these are Bolton, Bury, Manchester, Oldham, **Rochdale**, Salford, Stockport, Trafford, Tameside and Wigan. The overall aim of the GM BAP is:

"To promote the conservation, protection and enhancement of biological diversity in Greater Manchester for current and future generations".

- 2.2.26 The GM BAP provides Action Plans for the following habitats:

- Grasslands;
- Hedgerows;
- Lowland mosslands;
- Reedbeds and bittern;
- Ponds and lodges;
- Canals;
- Native woodlands;
- Uplands; and
- Urban managed greenspace.

² https://gmlrc.org/projects/gm_bap/

2.2.27 The GM BAP provides Action Plans for the following species:

- Bats;
- Black redstart;
- Farmland Birds;
- Great crested newts;
- Hares;
- Native Black Poplar;
- Twite;
- Water Vole; and
- Willow tit

2.3 Consultation

Table 2.1 Ecological Consultation Undertaken

Consultee	Date and Time	Comments	Actions
Greater Manchester Ecology Unit ('GMEU')	6 th January 2023	Discussions focused on potential impacts of the Proposed Development on the Rochdale Canal SAC. GMEU advised avoiding drainage/ run off into the Canal, or if not feasible, a robust Construction Environmental Management Plan ('CEMP') and mitigation. GMEU advised that recreational pressure on Rochdale Canal relates to boat traffic; therefore, given that the Proposed Development does not propose boat mooring, boat traffic relating to the Proposed Development should not be a factor. Discussion around shading of the Canal and adverse impacts associated. Concluded that the Proposed Development will embed a significant 'set-back' from the Canal and include vegetation management to ensure no over-shading. Through discussion with GMEU and Habitat Regulations Assessment ('HRA') undertaken to inform the PfE Plan it was concluded that the Hollingworth Road land parcel is not considered as functionally linked land to South Pennine Moors SPA. However, recreational pressure should be scoped into the assessment. Recreational pressure could be mitigated through contributions to a Local Nature Recovery Network strategy.	Drainage into Canal: Further design discussion with appointed drainage technicians to avoid or mitigate impacts and production of robust CEMP. Further consideration of recreational pressure on South Pennine Moors SPA and considerations for contributions to Local Nature Recovery, providing on-site alternative Green Infrastructure and 'home owner packs'

2.4 Assessment Methodology and Significance Criteria

Study Area

- 2.4.1 The boundary of the Hollingworth Road land parcel is shown by **Figure 2.1** below. Tyler Grange ecologists carried out numerous suites of surveys in 2018, 2019 and 2022 to establish the existing ecological conditions on-site. Further details including the extent of the surveys are provided below.
- 2.4.1 The study area includes a 10km radius for international statutory site designations, a 2km radius for national statutory site designations and non-statutory site designations, and a 2km radius for all protected and priority species records.

Figure 2.1: Hollingworth Road land parcel boundary and wider context (© Google Aerial Imagery)



Desktop Study

- 2.4.2 A number of desktop studies for the Hollingworth Road land parcel were undertaken between 2018 and 2022, and included information from the following sources:
- The Multi-Agency Geographic Information for the Countryside ('MAGIC')³ website for details of protected sites;
 - The RBC website⁴ for details of submitted planning applications in the vicinity of the Hollingworth Road land parcel; and
 - The Natural England 'Nature on the Map' website⁵.

³ Website: [MAGIC \(defra.gov.uk\)](https://magic.defra.gov.uk) accessed 2018-2022

⁴ Website: [Planning Rochdale BC](https://planning.rochdalebc.gov.uk) accessed 2018-2022

⁵ Website: [naturalengland-defra](https://naturalengland-defra.gov.uk) accessed 2018-2022

- 2.4.3 Data requests were also made to Greater Manchester Record Centre ('GMRC') on 10th October 2018 and an updated data search was made on 15th August 2022 for evidence of protected species and habitats and species of biodiversity concern.

Extended Phase 1 Habitat Surveys

- 2.4.1 An extended Phase I habitat survey was undertaken on 22nd August 2018 by Georgina Palmer, an experienced ecologist and a member of the Chartered Institute of Ecology and Environmental Management ('CIEEM'); the survey was subsequently revisited during Phase II surveys throughout the years of 2018 and 2019 and an updated targeted Phase I habitat survey was then undertaken on 1st September 2022 by Nick Bell, an experienced ecologist and a member of CIEEM.
- 2.4.2 **Figure 1.4 of Volume 3: Appendix A.4** shows a colour-coded habitat map of the Hollingworth Road land parcel, and further details of the survey methodology and results are provided in **Volume 3: Appendix A.4**.

Detailed Surveys

- 2.4.3 The need for further / update surveys of protected and / or priority species in / adjacent to the Hollingworth Road land parcel was identified. Details of the surveys carried out by Tyler Grange are provided within the respective Appendices for each species, as follows:
- [Confidential] Badger *Meles meles* survey (Volume 3: Appendix A.1);
 - Bat Survey (Volume 3: Appendix A.2);
 - Birds (Volume 3: Appendix A.3);
 - Extended Phase One habitat survey (Volume 3: Appendix A.4);
 - Great Crested Newt *Triturus cristatus* (Volume 3: Appendix A.5); and
 - Otter and Water vole survey (Volume 3: Appendix A.6).
- 2.4.4 The following figures have also been produced/included (see **Volume 3: Appendix A.7** of the ES)
- 11833_P18 – Figure 1.1.1 CONFIDENTIAL Badger Sett Location
 - 11833_P20 – Figure 1.2.1 Bat Emergence Results
 - 11833_P21 – Figure 1.2.2 Bat Activity Survey Results
 - 11833_P22 – Figure 1.3.1 Breeding Bird Survey Results
 - 11833_P23 – Figure 1.4.1 Habitat Features Plan
 - 11833_P24 – Figure 1.5.1 Pond Location Plan
 - Sensitivity, Value or Importance

- 2.4.5 The results of the field survey and ecological data gathered for the Hollingworth Road land parcel and adjacent habitats were used to evaluate impacts in accordance with guidance provided by the CIEEM (2018). This process included:
- Identifying those ecological features likely to be affected; and
 - Evaluating the features to identify those of importance i.e. those which, if their integrity or conservation status were affected, national or local policies (or in some cases legislation) would be triggered.
- 2.4.6 Evaluation was based on various characteristics that can be used to identify ecological features likely to be important in terms of biodiversity. These include site designations (such as SSSIs), or for undesignated features, the size, conservation status (locally, nationally or internationally), and the quality of the ecological feature. In terms of the latter, quality can refer to habitats (for instance if they are particularly diverse, or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats) or species populations or assemblages.
- 2.4.7 The level of importance of specific ecological features was assigned using a geographic frame of reference, with 'international and European' being most important, then:
- National;
 - Regional (North West);
 - County (Greater Manchester);
 - Local (Rochdale Borough Council); and
 - Within the Hollingworth Road land parcel only.

Assessment of Effects

- 2.4.8 The threshold for the level of importance, as described above, may be adapted by:
- Comparison with regulations or standards;
 - Reference to criteria such as protected species, protected sites, landscapes etc.;
 - Consultation with consultees and decision makers;
 - Compliance with policy (or plan) objectives;
 - Comparison with experience on similar projects elsewhere; and
 - Experience and professional judgement of the specialist assessor.
- 2.4.9 Taking the above into account, therefore levels of significance can be adapted through the above criteria.

Limitations

- 2.4.10 Minor limitations due to factors such as the weather are described in the species survey Appendices. However, these have been justified on a species surveys basis and it has been concluded that there are no uncertainties due to the absence of data or other limitations and assumptions which would otherwise affect the validity of this assessment.

2.5 Baseline Conditions

The Hollingworth Road land parcel

- 2.5.1 The Hollingworth Road land parcel comprises predominantly sheep grazed pasture associated with a farm complex located within the centre of the land parcel. There are defunct hedgerows forming old field boundaries with scattered trees and a woodland block within the southeast of the land parcel. Details of the habitats present are summarised below, with further details in **Volume 3: Appendix A.4.**

Designated Sites

- 2.5.2 There are two Internationally designated sites with 10km of the Hollingworth Road land parcel:
- Rochdale Canal Special Area of Conservation ('SAC')⁶ and Site of Special Scientific Interest ('SSSI')⁷ immediately adjacent to the north; and,
 - South Pennine Moors SAC/SSSI and South Pennine Moors Phase 2 Special Protection Area ('SPA') are located approximately 1km to the east.
- 2.5.3 SAC / SPA designations are of **international ecological importance**, and SSSIs are of **national ecological importance**. A summary of the designated sites is below:
- 2.5.4 Rochdale Canal SAC / SSSI contains *"important habitats for submerged aquatic plants and emergent vegetation, including extensive colonies of nationally scarce SAC species of floating water-plantain Luronium natans"*⁶, as well as pondweeds Potamogeton spp.
- 2.5.5 The South Pennine Moors SAC / SSSI / SPA contains *"the largest area of unenclosed moorland within West Yorkshire and contains the most diverse and extensive examples of upland plant communities in the country"*⁷. Three habitat types are listed on Annex 1 of the EC Habitats and Species Directive (92/43) EEC: 'European dry heaths', 'blanket bogs' and 'old sessile oak woods with Ilex and Blechnum in the British Isles'. This Hollingworth Road land parcel has SPA designations through supporting a moorland breeding bird assemblage of national importance, including (inter)nationally important breeding populations of merlin *Falco columbarius*, curlew *Numenius arquata*, golden plover *Pluvialis aprocaria* and twite *Carduelis flavirostris*.
- 2.5.6 The Hollingworth Road land parcel falls within SSSI risk zones of the aforementioned designated sites, and requires consultation with Natural England for applications for residential development of 50 or more houses.
- 2.5.7 There are four non-statutory sites, of which are entitled Sites of Biological Importance ('SBI'). They are:
- Rochdale Canal (Scowcroft to Warland) SBI, immediately north.
 - Hollingworth Lake SBI, 20m to the south;
 - South Pennine Moors (north) SBI 1.4km east; and,
 - Slopes by River Beal, Fir Grove Farm SBI, 1.9km south-west.

⁶ <http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?eucode=UK0030266>, accessed 07/01/23

⁷ <https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=s2000430>, accessed 07/01/23

Habitats and Flora

2.5.1 The Hollingworth Road land parcel supports the following habitats:

- Amenity grassland;
- Broadleaved woodland;
- Built form and hardstanding;
- Improved grassland;
- Marshy grassland;
- Native hedgerow with Trees;
- Scattered broad-leaved trees;
- Semi-improved grassland (poor);
- Species-poor defunct native hedgerow;
- Tall ruderal vegetation.

2.5.2 For ease of reference, the habitat types are described in detail in **Volume 3: Appendix A.4** and are shown on the Habitat Features Plan (**Figure 1.4.1 of Appendix A.4**). Habitats adjacent to the Hollingworth Road land parcel are described, as are invasive plants identified during the surveys.

Invasive Plant Species

2.5.3 The Hollingworth Road land parcel was checked for Himalayan balsam *Impatiens glandulifera*, Japanese Knotweed *Reynoutria japonica* and other such invasive plant species; Himalayan balsam was found to be present around the outbuildings of the farm complex only. A detailed search along the Rochdale Canal was undertaken but no invasive plants were recorded. An invasive species management plan shall be drawn-up through an appropriately worded planning condition, as discussed further in this assessment.

Fauna

2.5.4 Full details of relevant legislation, as well as survey methods and results are provided in appendices for each species / species group; a summary of results is provided below. Records of protected species within 1 km of the Hollingworth Road land parcel were provided by GMRC; these records are summarised under the relevant species / species group headings below.

Badger

2.5.5 The Hollingworth Road land parcel and surrounding habitats within 30m were surveyed for badgers on 25th June 2021 and again on 6th September 2022 by Tyler Grange.

2.5.6 The data search provided by GMRC returned seven records of badger setts within 1km of the Hollingworth Road land parcel. Four of those records relate to badger setts within adjacent land to the north.

2.5.7 Full details of relevant legislation, as well as survey methods and results are provided in the Confidential Appendix A.1; survey results are also shown on Figure 1.1.1.

Bats

- 2.5.8 Full details of relevant legislation, as well as survey methods and results are provided within **Volume 3: Appendix A.2**; survey results are also shown on **Figures 1.2.1 to 1.2.2 of Appendix A.2**. Bat emergence surveys were undertaken in relation to the farm buildings between July and August in 2019, with a repeat survey in August 2022. Eleven bat activity surveys were carried out in total; the first two in September and October 2018 and then monthly between April and August 2019. Two supplementary update surveys were undertaken in June 2021 and August 2022.
- 2.5.9 GMRC returned records of seven bat species or groups within 2km of the Hollingworth Road land parcel in the last 20 years:
- 13 Common pipistrelle *Pipistrellus pipistrellus* with the closest being 0.1km north-east of the land parcel.
 - 184 Pipistrelle sp *Pipistrellus* sp, with the closest being 0.1km north-east of the land parcel.
 - 3 Daubenton's bat *Myotis daubentoniid*, with the closest being 0.4km north of the land parcel.
 - 7 Soprano pipistrelle *Pipistrellus pygmaeus*, with the closes being 0.4km west of the land parcel.
 - 2 Noctule bat *Nyctalus noctule*, with the closest being 0.5km south-east of the land parcel.
 - 1 Whiskered/Brandt's bat *Myotis mystacinus* 0.8km north-west of the land parcel.
 - 2 Bat sp, with the closest being 1.8km south-east of the land parcel.

Bat Emergence

- 2.5.10 Across the suite of surveys conducted in 2019, common pipistrelle were observed emerging from B1 on two of the three surveys (visit 1 and visit 3). During the first visit (4th July 2019), one common pipistrelle was observed emerging from the southern gable-end of the farmhouse, close to the chimney base; the second recorded emergence (20th August 2019) comprised one common pipistrelle emerging from the south-western aspect of the farmhouse, close to the dormer window.
- 2.5.11 During the update emergence survey in August 2022, four common pipistrelle were observed emerging from the same roost location as of July 2019 (southern gable-end of farmhouse). No bats were observed from any other building during the surveys.
- 2.5.12 The majority of the trees on-site were assessed as providing negligible bat roosting potential, as many of the 'internal' trees were hawthorn and goat willow, providing unsuitable roosting opportunities. There is a mature ash south of B1, which was assessed as having moderate bat roosting potential. The woodland block to the south-east of the Hollingworth Road land parcel (surrounding the car park) comprised predominantly young/ early mature plantation, with no suitable roosting opportunities.

Bat Activities

- 2.5.13 A total of 1164 bat passes were recorded during the transect survey visits. These passes were from only four different species: common pipistrelle *Pipistrellus pipistrellus* (1117 passes), soprano pipistrelle *Pipistrellus pygmaeus* (11 passes), noctule bat *Nyctalus noctula* (35 passes), and myotis species *Myotis.spp* (1 pass).

- 2.5.14 In total, 19,089 bat passes were recorded from common pipistrelle, soprano pipistrelle, pipistrelle species, noctule bat, myotis species, and brown long-eared bat *Plecotus auratus*. Common pipistrelle bats were most frequently recorded and accounted for 96.2% of all bat activity, followed by myotis species at 1.8%. The remaining 2% was made up by 'pipistrelle species' (presenting calls at a frequency which could be either common or soprano), soprano pipistrelle, noctule bat, and brown long-eared bat activity. Bat Activity Results Plan (**Figure 7.2.2** of **Appendix A.2**) shows that the majority of bat activity was located to the south of the Hollingworth Road land parcel, with moderate levels of activity close to the pond, remaining areas of the Hollingworth Road land parcel recorded low bat activity.
- 2.5.15 It was therefore concluded that the Hollingworth Road land parcel offers low foraging opportunities, due to the relatively low number of passes, when considering the level of data collected (19,089 passes, divided by 55 days of recording, divided by two static detectors, equals and average of approximately 173 passes per night, per static). It was concluded that common pipistrelle are overwhelmingly the most common bat species found at the land parcel.

Breeding Birds

- 2.5.16 Full details of relevant legislation, as well as survey methods and results are provided in **Volume 3: Appendix A.3**; survey results are also shown on **Figure 1.3.1**.
- 2.5.17 GMRC returned 21 Section 41 bird records within 1km of the Hollingworth Road land parcel . Of those 21 species, the following were considered to be potentially present at the land parcel due to the habitats present:
- Bullfinch *Pyrrhula pyrrhula*;
 - Curlew *Numenius arquata*;
 - Dunnock *Prunella modularis*;
 - House Sparrow *Passer domesticus*;
 - Lapwing *Vanellus vanellus*;
 - Linnet *Linaria cannabina*;
 - Reed Bunting *Emberiza schoeniclus*
 - Skylark *Alauda arvensis*;
 - Song Thrush *Turdus philomelos*;
 - Starling *Sturnus vulgaris*.
- 2.5.18 Three breeding bird surveys were conducted between April and June 2019, with four update surveys conducted between May and June 2022. Based on the surveys undertaken, a total of eight priority bird species were recorded (bullfinch, dunnock, house sparrow, lapwing, linnet, reed bunting, song thrush, starling). Of those, four were recorded as either confirmed or probable breeders within the Hollingworth Road land parcel (dunnock, house sparrow, lapwing, song thrush). All confirmed or probable breeding species, other than lapwing, were recorded breeding within the boundary vegetation and the woodland block to the south.
- 2.5.19 Numbers of lapwing fluctuated throughout the surveys, with a peak count of 25 individuals on 16th May 2019, although four of the seven surveys recorded fewer than five individuals. Lapwing were recorded breeding within the open fields to the north-east of the Hollingworth Road land parcel (**Figure 1.3.1**) with breeding behaviour being recorded during three of seven

bird surveys – lapwing chicks were recorded on 10th May and 25th May 2022 (two and three chicks respectively, associated with one adult pair), with displaying birds being recorded on 9th June 2022. Based on the results of the seven surveys across 2019 and 2022, it is considered that there was one confirmed breeding territory.

Wintering Birds

- 2.5.20 One wintering bird survey was undertaken (see **Volume 1: Appendix A.3** for further details on the scope of assessment) on 11th October 2018. No species which are considered to be 'overwintering' were recorded, with starling being the only priority species recorded. Due to the South Pennine Moors SPA being designated for breeding birds and not overwintering birds, further surveys were deemed disproportionate.

Great Crested Newt and Other Amphibians

- 2.5.21 GMRC returned three records of great crested newt (*GCN*, *Triturus cristatus*) within 2km of the Hollingworth Road land parcel, with the nearest being 1.8km to the south-west in 2017. Records also returned six other amphibians within a 2km radius, all of which were common toad (*Bufo bufo*).
- 2.5.22 GCN has been surveyed extensively at the pond to the northeast of the Hollingworth Road land parcel (P1). There are a further two ponds (P2, P3) off-site to the north, and within 250m of the land parcel.
- 2.5.23 Across the six GCN presence/ absence surveys undertaken in 2019, no GCN were found to be present, with a peak count of four smooth newt *Lissotriton vulgaris* and one palmate newt *Lissotriton helveticus*. With regards to other amphibians, 72 toads were recorded on the first survey in March 2019; however, numbers dropped down to a peak of 17 for the remaining surveys, suggesting that toads were moving towards the pond in time for the breeding season.
- 2.5.24 Due to the absence of GCN within P1, update presence/ absence surveys were not considered necessary, instead, eDNA sampling was undertaken in spring 2021. The eDNA samples indicated an absence of GCN DNA within P1.
- 2.5.25 Full details of relevant legislation, as well as survey methods and results are provided in **Volume 3: Appendix A.5**; survey results are also shown on **Figure 1.5.1**.

Reptiles

- 2.5.26 GMRC returned no records for reptiles within 2km of the Hollingworth Road land parcel. The habitats on-site represent unsuitable habitat for reptiles due to the large expanses of heavily grazed grassland. Reptiles were therefore scoped out of further survey and not considered within the EIA.

Otter and Water Vole

- 2.5.27 GMRC returned three records of water vole within 2km of the Hollingworth Road land parcel; the nearest being 0.55km to the north-east along the Rochdale Canal. Both records were from 2007. GMRC returned 17 records of otter within 2km of the land parcel; all records relate to the River Roch, which is located 1.2km to the north, with no records being attributed to the Canal.
- 2.5.28 Targeted surveys for these species were not undertaken as they were considered disproportionate. During the two Extended Phase 1 surveys conducted at the Hollingworth Road land parcel (August 2018 and September 2022), the Canal embankment was searched in detail for water vole burrows, otter holts and field signs of both species. No evidence of water vole and otter were recorded. The embankment leading to the Canal was found to be heavily poached by grazing sheep, creating unsuitable burrowing/ holt conditions. The heavily

grazed nature of the embankment means there are very few tall grasses for both shelter and a food resource for water voles, and provides an exposed, unsuitable holt habitat for otter. Due to this, the land parcel was considered to be of negligible ecological importance for otter and water vole.

- 2.5.29 In addition, the proposed development has mitigation embedded into the design, to allow for a substantial buffer from the Canal, up to 70m at the closest point (Sustainable urban Drainage System (SuDS) works being 70m, with the housing development works being 110m from the Canal). It is largely accepted that a 5-8m buffer from water vole burrows provides sufficient enough protection from development, with a 30m buffer from otter holts. Due to the embedded mitigation and the unsuitable habitats present at the Hollingworth Road land parcel, otter and water vole were scoped out of further assessment.
- 2.5.30 Full details of relevant legislation, as well as survey methods and results are provided in **Volume 3: Appendix A.6**.

Other Fauna

- 2.5.31 GMRC returned seven hedgehog *Erinaceus europaeus* records within 2km of the Hollingworth Road land parcel, the nearest being 0.8km to the north-west.
- 2.5.32 GMRC returned five records of brown hare *Lepus europaeus* within 2km of the Hollingworth Road land parcel, all of which coming from the moorland habitat to the south-east.

Identification of Ecological Features

- 2.5.33 The ecological importance and sensitivity of resources within Zol of the proposals are summarised in **Table 2.2**, below.

Table 2.2 Identification of Ecological Features

Ecological resource	Evaluation	Ecological Importance	Sensitivity
Statutory / non-statutory nature conservation designations			
Rochdale Canal SAC	SACs provide statutory protection for the best examples of European flora, fauna, or geological or physiographical features. They are of international importance.	International Importance	Highly sensitive to change and not readily replaced in the short or long term.
South Pennine Moors SAC/SSSI	SACs and SSSIs provide statutory protection for the best examples of European flora, fauna, or geological or physiographical features. They are of international importance.	International Importance	Highly sensitive to change and not readily replaced in the short or long term.
South Pennine Moors Phase 2 SPA	SPAs provide statutory protection for the best examples of European flora, fauna, or geological or physiographical features. They are of international importance.	International Importance	Highly sensitive to change and not readily replaced in the short or long term.
Rochdale Canal SBI	SBI are designated on the basis that they meet selection criteria for sites of nature conservation importance at a county level and are therefore of local ecological importance.	Local Importance	Sites of Biological Interest cover a broad range of ecological receptors and habitats and cannot be readily replaced in the short term but most are achievable long-term.

Ecological resource	Evaluation	Ecological Importance	Sensitivity
Hollingworth Lake SBI	SBI's are designated on the basis that they meet selection criteria for sites of nature conservation importance at a county level and are therefore of local ecological importance.	Local Importance	SBI's cover a broad range of ecological receptors and habitats and cannot be readily replaced in the short term but most are achievable long-term.
South Pennine Moors (north) SBI	SBI's are designated on the basis that they meet selection criteria for sites of nature conservation importance at a county level and are therefore of local ecological importance.	Local Importance	The SBI boundary is encompassed by the SAC, which covers a broad range of ecological receptors and habitats and cannot be readily replaced in the short term and long term effects from air pollution are considered an impact pathway making the Hollingworth Road land parcels sensitive to change.
Slopes by River Beal, Fir Grove Farm SBI	SBI's are designated on the basis that they meet selection criteria for sites of nature conservation importance at a county level and are therefore of local ecological importance.	Local Importance	SBI's cover a broad range of ecological receptors and habitats and cannot be readily replaced in the short term but most are achievable long-term.
Habitats			
Amenity Grassland	Area of amenity grassland around the farm building in the central area of the Hollingworth Road land parcel is species-poor and managed as a garden. This is considered to be of negligible ecological importance.	Negligible Importance	Not Sensitive
Broadleaved woodland	Area of broadleaved woodland to the southeast of the Hollingworth Road land parcel, which comprises both mature species and early-mature plantation species.	Local importance	Cannot be replaced short term and is sensitive to pollution (dust/air)
Built Form and Hard-standing	Inherently of negligible ecological importance.	Negligible Importance	Not Sensitive
Improved Grassland	The dominant habitat type within the Hollingworth Road land parcel is improved grassland, which makes up the majority of the area of the fields on-site. This is considered to be of negligible ecological importance.	Negligible Importance	Not Sensitive
Marshy Grassland	Areas of marshy grassland within the southern and eastern areas of the Hollingworth Road land parcel set within fields of improved grassland. This habitat is dominated by soft rush, with low species diversity beyond the rush. These areas are sheep grazed, as of the improved grassland, and therefore forbs and grasses between the rush are heavily grazed.	Negligible Importance	Sensitive to changes in hydrology

Ecological resource	Evaluation	Ecological Importance	Sensitivity
Native Species Hedgerow with Trees	A hedgerow to the south of the Hollingworth Road land parcel comprising 'gappy' hawthorn hedgerow with mature broadleaved trees.	Local Importance	Cannot be replaced short term and is sensitive to pollution (dust/air)
Pond	There is a pond located within the north-eastern corner of the Hollingworth Road land parcel. There are few ponds within the local area, which are therefore considered to be of local ecological importance.	Local Importance	Highly sensitive to pollution and changes in water table, but easily replaced.
Scattered Broad-leaved Trees	There are scattered trees throughout the Hollingworth Road land parcel; some mature sycamore and ash to the south, with willow and hawthorn in the central and northern portions of the land parcel. As there is limited canopy cover within the majority of the land parcel and in the adjacent wider landscape, the scattered trees are considered to be of local ecological importance.	Local Importance	Cannot be replaced short term and is sensitive to pollution (dust/air)
Semi-improved Grassland (poor)	There is one field, east of the Hollingworth Road land parcel, adjacent to Hollingworth Road, which was found to contain a greater species diversity than the remaining fields. Despite this, the species assemblage is still relatively low, with the field itself being relatively small in size; therefore considered to be of negligible ecological importance.	Negligible Importance	Not Sensitive
Species-poor Defunct Native Hedgerow	One species-poor defunct hedgerow is present to the north of the Hollingworth Road land parcel. It comprises an old field boundary with scattered hawthorn accounting for the only trees/ shrubs. Due to the lack of vegetation and species diversity this habitat is of negligible ecological importance.	Negligible Importance	Not Sensitive
Tall Ruderal Vegetation	A small section of tall ruderal is present close to the farm buildings; comprising predominantly of common nettle, with low species diversity, and therefore negligible ecological importance.	Negligible Importance	Not Sensitive
Protected / Priority Species			
Badgers	A main badger sett was identified off-site to the north (on the border of the former Akzo Nobel site). An outlier sett was also recorded within the Akzo Nobel site which was being closed under licence. No latrines or other direct evidence of badger was recorded within the Hollingworth Road land parcel, although mammal runs extend from off-site, into the land parcel, in a number of locations.	Local importance (but there is a legislative requirement under the PBA)	Not overly sensitive to change and will readily excavate new setts. Faithful to long-established main setts and territorial, however.

Ecological resource	Evaluation	Ecological importance	Sensitivity
	The Hollingworth Road land parcel is considered to be important in maintaining the local badger population.		
Bats	A bat roost was identified in the farmhouse (B1), during the 2019 and 2022 surveys, with a peak count of four common pipistrelle using the roost. The trees on-site were assessed as providing negligible bat roosting potential, other than the mature ash, south of B1. The woodland to the south-east of Hollingworth Road land parcel, pond, grassland, marshy grassland provide foraging resource for bats and a total of four species groups were recorded during the activity surveys. The land parcels considered to be important in maintaining local bat populations	Local importance	Highly sensitive to changes in lighting in particular and faithful to known roost sites.
Breeding Birds	The habitats comprising much of the Hollingworth Road land parcel noted to support a cohort of common and widespread species which are typical of the area and habitats present. Four priority bird species were recorded as either confirmed or probable breeders on-site (dunnock, house sparrow, lapwing, song thrush); with lapwing being the only species breeding in the open grassland habitat, the remaining three species breeding in boundary vegetation. The land parcel is considered to be important in maintaining these populations on a local level.	Local importance	Most species are highly sensitive to disturbance from human activity; but may be accustomed to some level of disturbance at a site level due to the number of PROWs within the land parcel. Species will readily occupy suitable habitat if free from disturbance by humans.
Over-wintering Birds	Habitats on-site are considered largely unsuitable for over-wintering birds; with the defunct hedgerows and sparsely scattered trees providing limited shelter for winter-thrushes, with the open grassland being too enclosed by developments to be suitable for over-wintering geese.	Negligible importance	Most species highly sensitive to disturbance from human activity. Will readily occupy suitable habitat if free from disturbance by humans.
Great Crested Newt and other Amphibians	GCN were found to be absent from the on-site pond, through presence/ absence surveys in 2019 and eDNA sampling in 2021. Common amphibian species were found to be present within the P1 and in adjacent terrestrial habitat, with large numbers of common toad recorded during the March 2019 survey. The land parcel is therefore of negligible importance for GCN, but of local importance for other amphibians, in particular common toad.	Local importance	Highly sensitive to changes in habitat quality and type given their restricted terrestrial range from breeding ponds.

Ecological resource	Evaluation	Ecological Importance	Sensitivity
Hedgehog	The heavily grazed open grassland which forms the majority of the habitat on-site provides unsuitable habitat for hedgehog, with suitable habitat being restricted to boundary vegetation. The land parcel is unlikely to be important in maintaining local populations of this species.	Negligible importance	Not sensitive.
Brown hare	The open grassland habitat may provide suitable habitat for brown hare, but with the land parcel being bound by residential development to the west and south which would cause disturbance, and with more suitable habitat in the wider area, the land parcel is unlikely to be important in maintaining local populations.	Negligible importance	Highly sensitive to disturbance from human activities.

2.6 Primary and Tertiary Mitigation

- 2.6.1 The development proposals are designed to (where possible) avoid, reduce or compensate for likely significant effects. Primary mitigation is an intrinsic part of the project design; primary mitigation measures are outlined within **Volume 1: Chapter 3** of this ES, and are broadly summarised below.
- 2.6.2 The following mitigation measures have been 'embedded' into the detailed design and are therefore 'primary mitigation', to address potential significant ecological effects of the proposed development identified during the assessment process.
- 2.6.3 Tertiary mitigation are measures which would be required regardless of and EIA assessment, as it is imposed, for example, as a result of legislative requirements and / or standard sectoral practices (for example a CEMP). The following sections therefore describe the primary and tertiary mitigation.

Demolition and Construction

- 2.6.4 Rochdale Canal SAC is located immediately to the north of the Hollingworth Road land parcel. The Canal has been provided with a large buffer from development works, which is approximately 70m from the nearest SuDS works and approximately 110m from the nearest 'housing development works'. Habitats of highest ecological value/ importance in other areas of the land parcel and immediately adjacent (woodland, scattered mature trees and off-site pond P1) have been avoided, thereby avoiding many potential ecological impacts both on habitats/the general biodiversity value of the land parcel and the protected/notable species they support.

Completed and Operational Development

- 2.6.5 The design of the Proposed Development and associated landscaping has been produced with the following key objectives in mind:
- To provide a buffer to sensitive ecological features, namely Rochdale Canal SAC (at least 70m buffer, resulting in no addition shading/ outcompeting of designated features), pond P1 (at least 8m buffer) existing trees (in accordance with root protection area, RPA), hedgerows on-site (in accordance with RPA); and

- Creation of green and blue infrastructure within the development design, which can be multi-functional, delivering a minimum of 10% net gain in biodiversity, amenity, aesthetic and drainage benefits. The BNG calculations for Hollingworth Road have achieved an 11.75% Net Gain; full details of the BNG assessment can be found within the BNG Assessment report which is appended to this EIA.

Assessment of Likely Effects

Demolition and Construction

- 2.6.6 The potential impacts of the Proposed Development on each of the ecological receptors identified, taking into account the embedded mitigation discussed above, are described in relation to the Demolition and Construction phase in **Table 2.3** below, with the level of significance to each impact also provided.

Table 2.3 Demolition and construction phase impacts on ecological resources within the Zol.

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Legislative and planning policy implications*	Potential level of significance in the absence of secondary mitigation
Statutory / non-statutory nature conservation designations				
Rochdale Canal SAC (International)	The SAC is located adjacent to the northern boundary of the Hollingworth Road land parcel. It is designated solely for floating water plantain (<i>L.natans</i>), and therefore water pollution during the construction phase is considered to be a potential impact. The PfE HRA⁸ describes potential impacts on this species, noting that it “may not be particularly sensitive to changes in water chemistry”, and therefore any temporary changes during the construction phase is unlikely to have an adverse, permanent impact. Furthermore, ‘primary’ mitigation shall be embedded into the proposals for the proposed development, which includes a drainage strategy to mitigate water pollution through the use of specific temporary drainage systems (see Hydrology and Drainage chapter for further details). In summary, a temporary drainage system will be implemented on-site to cater for the surface water run-off generated by the construction phase; this system will collect, direct and attenuate surface water to discharge into the Rochdale Canal. The temporary drainage system must ensure the protection of water quality in the receiving waterbodies. A variety of other good environmental practices (such as silt traps) will be	Adverse, temporary, indirect, minor magnitude	NPPF LPP	Minor adverse impact significant at national level = Minor adverse

⁸ Habitats Regulations Assessment of the Places for Everyone Joint Development Plan, February 2022

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Legislative and planning policy implications*	Potential level of significance in the absence of secondary mitigation
	implemented to minimise any effects of sediment loading at the source. It is therefore concluded that, with the 'primary' mitigation measures embedded (including the drainage strategy, substantial buffer and best practice methods) any potential impacts arising from the construction phase are anticipated to be temporary and minor. Measure to control impacts such as dust and litter during construction are described in Section 7.7 as 'secondary' mitigation.			
South Pennine Moors SAC/SSSI (International)	The SAC is located 1km south-east of the Hollingworth Road land parcel. The land parcel has designations for three habitats associated with the moorlands, of which none are present at the land parcel, with no direct linking habitats. The PfE HRA describes the potential for airborne ammonia, nitrogen and acid deposition to "have only a marginal effect on the South Pennine Moors, and would not result in any measurable reduction in the extent of blanket bog or other specified habitats". Therefore, no impacts arising from airborne pollution during the construction phase are anticipated.	None	NPPF LPP	None
South Pennine Moors Phase 2 SPA (International)	The SPA is located 1km south-east of the Hollingworth Road land parcel and is designated for breeding populations of birds. The land parcel is considered unsuitable for those species (merlin <i>falco columbarius</i>, golden plover <i>Pluvialis apricaria</i>) The PfE HRA concludes that the land parcel is "<i>not functionally linked to the SPA</i>". The PfE HRA describes the potential for airborne ammonia, nitrogen and acid deposition to "<i>have only a marginal effect on the South Pennine Moors, and would not result in any measurable reduction in the extent of blanket bog or other specified habitats</i>". Therefore, no impacts arising from airborne pollution during the construction phase are anticipated.	None	NPPF LPP	None

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Legislative and planning policy implications*	Potential level of significance in the absence of secondary mitigation
Rochdale Canal SBI (County)	Located adjacent to the northern boundary of the Hollingworth Road land parcel, and has designations for other plants species, in addition to <i>L.natans</i> . The SBI boundary is coincident to the SAC, and therefore mitigation measure described above apply to this SBI	Adverse, temporary, indirect, minor magnitude	NPPF LPP	Minor adverse impact significant at national level = Minor adverse
Hollingworth Lake SBI (County)	Located 20m from the southern land parcel boundary. Designated for its assemblage of bird species and wetland habitats. It is possible that noise (disturbance of birds at the Lake), air and water pollution created during construction could impact the SBI.	Adverse, temporary, short term, direct, moderate magnitude	NPPF LPP	Adverse impact significant at the county level = Moderate adverse
South Pennine Moors (north) SBI (County)	Located 1.4km south-east of the Hollingworth Road land parcel. Considerations for the SBI are covered by the South Pennine Moors SAC and SPA. The PFE HRA describes the potential for airborne ammonia, nitrogen and acid deposition to "have only a marginal effect on the South Pennine Moors, and would not result in any measurable reduction in the extent of blanket bog or other specified habitats". Therefore, no impacts arising from airborne pollution during the construction phase are anticipated.	None	NPPF LPP	None
Slopes by River Beal, Fir Grove Farm SBI	Located 1.9km south-west. Designated for its woodland/ scrub habitats on the embankment of River Beal. Given the distance from the Hollingworth Road land parcel, within no linking habitats and the land parcel being beyond the 50m ZoI for dust and nitrogen deposits, no impacts from the construction phase are anticipated.	None	NPPF LPP	None

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Legislative and planning policy implications*	Potential level of significance in the absence of secondary mitigation
Habitats				
Amenity Grassland (Negligible)	Permanent loss of all amenity grassland habitat on-site.	Permanent, adverse, direct, negligible	None	Negligible
Broadleaved Woodland (Local)	Retained as part of the embedded mitigation. Both temporary and permanent damage to the woodland through pollution during the construction phase is possible.	Permanent, adverse, direct, local	NPPF LPP	Adverse impact significant at the local level = Minor adverse
Built Form and Hard-standing (Negligible)	Permanent loss of built form and hardstanding.	Permanent, adverse, direct, negligible	None	Negligible
Improved Grassland (Negligible)	Permanent loss of much of the improved grassland across the Hollingworth Road land parcel.	Permanent, adverse, direct, negligible	None	Negligible
Marshy Grassland (Negligible)	Permanent loss of this habitat on Hollingworth Road land parcel.	Permanent, adverse, direct, local	NPPF LPP	Negligible
Native Hedgerow with Trees (Local)	Hedgerow to the south of the Hollingworth Road land parcel, retained as part of the primary mitigation. Both temporary and permanent damage to the woodland through pollution during the construction phase is possible.	Permanent, adverse, direct, local	NPPF LPP	Adverse impact significant at the local level = Minor adverse
Pond (Local)	Pond P1, retained as part of the embedded mitigation. Both temporary and permanent damage to the pond through pollution during the construction phase is possible.	Permanent, adverse, direct, local	NPPF LPP	Adverse impact significant at the local level = Minor adverse
Scattered Broad-leaved Trees (Local)	Minor tree loss is expected (see AIA); retained trees may be impacted during the construction phase through physical damage as well as noise, air, light and water pollution	Permanent, adverse, direct, local	NPPF LPP	Adverse impact significant at the local level = Minor adverse
Poor Semi-improved Grassland (Negligible)	Permanent loss of semi-improved grassland.	Permanent, adverse, direct, negligible	None	Negligible

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Legislative and planning policy implications*	Potential level of significance in the absence of secondary mitigation
Species-poor Defunct Native Hedgerow (Negligible)	Permanent loss of this habitat on-site.	Permanent, adverse, direct, negligible	None	Negligible
Tall Ruderal Vegetation (Negligible)	Permanent loss of this habitat on-site.	Permanent, adverse, direct, negligible	None	Negligible
Not-native Invasive (Negligible)	Potential impact through accidental spreading of non-native invasive species, such as the Himalayan balsam found at the central farm.	Permanent, adverse, direct, local	NPPF LPP	Adverse impact significant at the local level = Minor adverse
Protected and Priority Species				
Badgers (Local)	A main sett is located off-site to the north (exact details to remain confidential). Embedded mitigation includes a minimum 30m buffer from the nearest sett entrance to the proposed works and therefore will not be directly affected by development, but there may be some disturbance and temporary loss of foraging habitat for this species during the construction phase.	Permanent, long-term, adverse, direct, local	PBA	Permanent adverse at the local level = Minor adverse
Bats (Local)	Building B1 was found to contain a small common pipistrelle roost (recorded on three occasions, with a peak count of four individuals). The proposals include the demolition of the farm buildings (inc. B1). The roost currently meets the criteria to be removed under a low impact class licence from Natural England, which allows the damage or destruction of low conservation status bat roosts. Tree loss across the Hollingworth Road land parcel is small scale and focused on trees with negligible bat roosting potential, therefore no impacts on tree roosts during construction are anticipated. The habitats being lost on-site are generally of low quality for bats (open, species poor grassland), but disturbance to foraging and commuting bats could arise from increased lighting and noise associated with the construction phase, particularly to the south of the Hollingworth Road land parcel and surrounding the pond habitat, where bat activity was at its highest.	Permanent, long-term, adverse, direct, low magnitude.	NPPF, WCA5, S41, CHSR LBAP UKBAP in respect of soprano pipistrelle, noctule and brown long-eared NERC in respect of species apart from common pipistrelle	Permanent adverse within the context of the local area = Minor adverse

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Legislative and planning policy implications*	Potential level of significance in the absence of secondary mitigation
Breeding Birds (Local)	The majority of suitable habitat for this species group will be retained (woodland, trees, hedgerows, pond), along with a buffer to the Rochdale Canal. Some scrub, hedgerow and tree loss will be necessary during construction, and although avoided as much as possible, clearance of habitats during the bird nesting season could contravene wildlife legislation. Impacts on Species of Principal Importance are anticipated (duncock, house sparrow, lapwing, song thrush) through the loss of habitat during construction	Permanent, long-term, adverse, direct, low magnitude.	WCA5, NPPF, NERC, S41, LBAP, UKBAP	Permanent adverse at the local level = Minor adverse
Over-wintering Birds (Negligible)	Habitats on-site are considered largely unsuitable for over-wintering birds. Therefore, no impacts on this species group are anticipated during the construction phase.	None	WCA5, NPPF, NERC, S41, LBAP, UKBAP	None
Amphibians (Local)	GCN were found to be absent from pond P1, through presence/ absence surveys in 2019 and eDNA sampling in 2021. Common amphibian species were found to be present within P1 and in adjacent terrestrial habitat, with large numbers of common toad recorded during the March 2019 survey. The land parcel is therefore of negligible importance for GCN, but of local importance for other amphibians, in particular common toad. It is therefore possible that amphibians could be accidentally killed/ injured during construction.	Permanent, long-term, adverse, direct, low magnitude.	NPPF, WCA5, S41, LBAP NERC - in respect of common toad, WCA5, S41, UKBAP	Permanent adverse but at local level= Minor adverse, and with policy/best-practice requirement to protect individual amphibians
Other Protected and Notable Fauna				
Hedgehog (Negligible)	The Hollingworth Road land parcel provides largely unsuitable habitat for hedgehog., with the vast majority of suitable habitats for this species (woodland, hedgerows) are being retained. However, removal of barn buildings, tall ruderal and marshy grassland could lead to accidental killing/ injury during the construction phase.	Permanent, long-term, adverse, direct, low magnitude.	NERC, S41, UKBAP	Permanent adverse at the local level = Minor adverse

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Legislative and planning policy implications*	Potential level of significance in the absence of secondary mitigation
Brown hare (Negligible)	The land parcel is considered to be unsuitable for this species (Table 7.2) and any works during the construction phase are unlikely to impact upon this species	None	NERC, S41, UKBAP	None
*Abbreviations are defined with the Planning Policy Context section above				

Completed and Operational Development

- 2.6.7 The potential impacts of the Proposed Development on each of the ecological receptors identified, taking into account the embedded mitigation discussed above, are described in relation to the Completed and Operational Development in **Table 2.4** below, with the level of significance to each impact also provided.

Table 2.4 Potential impacts during the operational phase in the absence of secondary mitigation.

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Potential level of significance in the absence of secondary mitigation
Statutory / non-statutory nature conservation designations			
Rochdale Canal SAC (International)	The SAC is located adjacent to the northern boundary of the Hollingworth Road land parcel. It is designated solely for floating water plantain (<i>L.natans</i>), and therefore water pollution during the operational phase is considered to be a potential impact pathway, through run-off and hydrological connections to the Canal. Although there is "limited understanding of the effects of water pollution on this plant"⁸, long term impacts arising from water pollution during the operational phase is a potential impact pathway. However, primary mitigation has been embedded into the proposals, which include a robust drainage strategy, including SuDS (described in Section 7.7.29). Overshading of the Canal through vegetation encroachment and shading from development may also adversely impact floating water plantain. Primary mitigation in the form of a substantial buffer from the development footprint shall minimise impacts. Secondary mitigation in the form of vegetation management is discussed in Section 7.7.29. The Air Quality assessment for the consented adjacent scheme (21/01146/FUL) concluded that air pollution from the operational phase was not predicted to be significant. In addition, Table 9.1 of the PFE HRA⁸ describes Airborne NOx and NH3 as indicating no adverse effects. Impacts	Adverse, permanent, long-term, indirect, minor magnitude	Adverse impact significant at national level = Minor adverse

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Potential level of significance in the absence of secondary mitigation
	arising from Air pollution as a result of the operational phase is therefore considered to be negligible. It is therefore concluded that, with the 'primary' mitigation measures embedded (drainage strategy, substantial buffer, SuDS) potential impacts arising from water pollution and overshadowing at the operational phase are anticipated to be of a minor impact magnitude.		
South Pennine Moors SAC/SSSI (International)	The SAC is located 1km south-east of the Hollingworth Road land parcel. The land parcel has designations for three habitats associated with the moorlands, of which none are present at the land parcel, with no direct linking habitats. The PfE HRA describes the potential for airborne ammonia, nitrogen and acid deposition to "have only a marginal effect on the South Pennine Moors, and would not result in any measurable reduction in the extent of blanket bog or other specified habitats". Therefore, no impacts arising from airborne pollution during the operational phase are anticipated. The PfE HRA considers housing developments of more than 50 houses and within 7km of the SAC/ SPA as potential impact pathways for recreational pressure. Recreational pressures resulting from the operational phase of the development are therefore anticipated. Primary mitigation has been incorporated into the scheme, through the provision of large green infrastructure through the centre of the land parcel, with footpaths. This alternative greenspace will also link to existing, well established public rights of way along the Rochdale Canal and Hollingworth Lake. It is therefore concluded that primary mitigation will minimise impacts arising from recreational pressure, but secondary mitigation in the form of home owner packs and contributions to local recovery networks is discussed further in this assessment.	Adverse, permanent, long-term, indirect, high magnitude	Adverse impact significant at national level = Major adverse
South Pennine Moors Phase 2 SPA (International)	The SPA is located 1km south-east of the land parcel and is designated for breeding populations of birds. The Hollingworth Road land parcel is considered unsuitable for those species. The PfE HRA concludes that the land parcel is "not functionally linked to the SPA". However, as discussed in relation to the SAC, recreational impacts are anticipated for the SPA.	Adverse, permanent, long-term, indirect, high magnitude	Adverse impact significant at national level = Major adverse

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Potential level of significance in the absence of secondary mitigation
Rochdale Canal SBI (County)	Located adjacent to the northern boundary and has designations for other plants species, in addition to <i>L.natans</i>. It is therefore possible that the other plant species may be more susceptible to environmental changes than the plantain. As a result, air and water pollution created during the operational phase could impact upon those species and therefore the SBI.	Adverse, permanent, long-term, indirect, minor magnitude	Adverse impact significant at national level = Minor adverse
Hollingworth Lake SBI (County)	Located 20m from the southern boundary. Designated for its assemblage of bird species and wetland habitats. It is possible that noise and air pollution created during operation could impact the SBI (no hydrological connections are proposed, which could otherwise provide potential water pollution). The SBI has well established footpaths and infrastructure, therefore, impacts arising from recreational pressure are not likely.	Adverse, permanent, medium-term, direct, high magnitude	Adverse impact significant at the county level = Moderate adverse
South Pennine Moors (north) SBI (County)	Located 1.4km south-east of the Hollingworth Road land parcel. Considerations for the SBI are covered by the South Pennine Moors SAC and SPA. Impacts resulting from pollution from the operational phase are not considered to have any measurable reduction in designated habitats of the SAC/ SBI. However, as described, recreational pressure as a result of the additional houses could provide an adverse impact.	Adverse, permanent, medium-term, direct, high magnitude	Adverse impact significant at the county level = Moderate adverse
Slopes by River Beal, Fir Grove Farm SBI	Located 1.9km south-west. Designated for its woodland/ scrub habitats on the embankment of River Beal. Given the distance from the Hollingworth Road land parcel, within no linking habitats and the land parcel being beyond the 50m Zol for dust and nitrogen deposits, no direct impacts from the operational phase are anticipated. Indirect impacts from recreational pressure are not anticipated due to the abundance of existing alternative 'greenspace' within closer proximity to the land parcel, such as the Canal towpaths, Hollingworth Lake and alternative greenspace proposed as part of the Proposed Development.	None	None

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Potential level of significance in the absence of secondary mitigation
Habitats and Flora			
Amenity Grassland (Negligible)	None expected, as all habitats will be removed during construction	None	None
Broadleaved Woodland (Local)	Retained as part of embedded mitigation for the development. Both temporary and permanent damage through human activities during the operational phase is possible in the absence of further mitigation / on-going habitat management and control of non-native invasive species	Permanent, adverse, direct, local, low magnitude	Adverse impact significant at the local level = Minor adverse
Built Form and Hard-standing (Negligible)	None expected, as all habitats will be removed during construction	None	None
Improved Grassland (Negligible)	None expected, as all habitats will be removed during construction	None	None
Marshy Grassland (Negligible)	None expected, as all habitats will be removed during construction.	None	None
Native Hedgerow with Trees (Local)	Retained as part of the embedded mitigation. Both temporary and permanent damage through human activities during the operational phase is possible.	Permanent, adverse, direct, local, low magnitude	Adverse impact significant at the local level = Minor adverse
Pond (Local)	Retained as part of the embedded mitigation. Both temporary and permanent damage to the pond through human activities during the operational phase is possible in the absence / on-going habitat management and control of non-native invasive species	Permanent, adverse, direct, local, low magnitude	Adverse impact significant at the local level = Minor adverse
Scattered Broad-leaved Trees (Local)	Degradation of retained habitats resulting from increased human activity and inappropriate management.	Adverse, permanent, direct, medium term, low magnitude	Adverse impact significant at the local level = Minor adverse
Semi-improved Grassland (Negligible)	None expected, as all habitats will be removed during construction.	None	None
Species-poor Defunct Native Hedgerow (Negligible)	Permanent loss of this habitat on-site.	Permanent, adverse, direct, negligible	Negligible

Ecological resource (ecological importance)	Description of potential impact	Nature of effect	Potential level of significance in the absence of secondary mitigation
Tall Ruderal Vegetation (Negligible)	Permanent loss of this habitat on-site.	Permanent, adverse, direct, negligible	Negligible
Protected and Notable Species			
Badgers (Local)	Disturbance to species using retained and adjacent habitats resulting from increased noise, traffic movement and human activity. Management of habitats could result in killing / injury.	Permanent, long-term, adverse, direct, local	Adverse impact significant at a local level = Minor adverse
Bats (Local)	Destruction of roost of low conservation status in B1. Disturbance to foraging and commuting bats resulting from increased lighting associated with development. Disturbance to new roost sites resulting from increased lighting.	Permanent, long-term, adverse, direct, low magnitude.	Adverse within the context of the local area = Minor adverse
Breeding Birds (Local)	Disturbance to species using retained and adjacent habitats resulting from increased noise, traffic movement and human activity. Management of habitats during the bird nesting season could contravene wildlife legislation.	Adverse, permanent, long-term, direct, low magnitude	Adverse impact significant at the local level = Minor adverse
Over-wintering Birds (Negligible)	Habitats on-site are considered largely unsuitable for over-wintering birds. Therefore, no impacts on this species group are anticipated during the operational phase.	None	None
Amphibians (Local)	Disturbance to amphibian species using retained and adjacent habitats resulting from increased noise, traffic movement and human activity. Management of habitats could result in killing / injury. Risk of mortality of individual amphibians becoming trapped in gulley pots.	Permanent, long-term, adverse, direct, low magnitude.	Adverse but at local level= Minor adverse, and with policy/best-practice requirement to protect individual amphibians
Other Protected and Notable Species			
Hedgehog (Negligible)	Disturbance to species using retained and adjacent habitats resulting from increased noise, traffic movement and human activity. Management of habitats could result in killing / injury.	Permanent, long-term, adverse, direct, low magnitude.	Permanent adverse at the local level = Minor adverse
Brown hare (Negligible)	The Hollingworth Road land parcel is considered to be unsuitable for this species and therefore no impacts considered during the operational phase.	None	None

2.7 Further Mitigation and Enhancement

- 2.7.1 This section describes the measures which are required to mitigate any significant environmental effects with regards to ecology in relation to the Proposed Development.

Demolition and Construction

- 2.7.2 Measures to protect ecological features are embedded as 'primary' mitigation, such as appropriate fencing of the Hollingworth Road land parcel during construction, appropriate lighting during construction and following best practice Pollution Prevention Guidelines, as standard for any development. The Construction and Environmental Management Plan (CEMP) will provide site-specific protection measures during the construction phase.
- 2.7.3 Retained woodland habitat and scattered trees will be protected throughout the construction phase to BS5837 standards, as detailed in the Arboricultural Impact Assessment ('AIA').
- 2.7.4 Statutory Designated sites: construction related pollution such as dust and litter etc. is expected, but this can be adequately mitigated through the adoption and implementation of a robust CEMP (other pollutants such as water pollution from run-off during construction will be mitigated through 'primary' mitigation, embedded into the scheme).
- 2.7.5 The CEMP will detail how site activity will suppress dust generation and minimise litter. The CEMP will also detail the provision of spill kits as necessary to prevent pollution of the SAC from accidental spills of contaminants during construction. Effects on the other statutory sites within the Zol are not anticipated during the construction phase.
- 2.7.6 Non-statutory designated sites: moderate adverse impacts arising from pollution may occur at the two SBIs which are considered to be within the Zol for potential impacts during construction. Rochdale Canal SBI and Hollingworth Lake SBI are considered to be close enough to the Hollingworth Road land parcel to potentially experience air, water and noise pollution. Measures in the CEMP such as pollution prevention guidelines and sensitive noise levels during construction will mitigate these impacts. The CEMP should also include measures to prevent incidental damage to the adjacent Rochdale Canal, given appropriate buffering, through the installation of Heras fencing and a plan clearly outlining 'no construction activity' zones.
- 2.7.7 Habitats and Flora: the following text sets out the specific mitigation requirements for individual habitats within the Hollingworth Road land parcel. Those assessed as being of **negligible ecological importance** do not require any specific mitigation.

Habitats

Broadleaved Woodland

- 2.7.8 The woodland comprising the southeastern corner of the Hollingworth Road land parcel, located around the car park, shall be retained as part of the embedded mitigation. To mitigate potential impacts on this feature, it will be necessary to include measures in the detailed CEMP (subject to condition on approval) for the land parcel which set out how the woodland will be protected during the construction phase. This should include, but not be restricted to:
- Root Protection Zones ('RPZ') being fenced-off with clear signage;
 - Implementing dust suppression methods; and
 - Ensuring a spill response strategy is in place.

Native Hedgerow with Trees

2.7.9 The hedgerow comprising the Marshy grassland field boundary to the south of the Hollingworth Road land parcel shall be retained. To mitigate potential impacts on this feature, it will be necessary to include measures in a CEMP which set out how the woodland will be protected during the construction phase. This should include, but not be restricted to:

- RPZ being fenced-off with clear signage;
- Implementing dust suppression methods; and
- Ensuring a spill response strategy is in place.

Pond

2.7.10 The pond in the northeast corner of the Hollingworth Road land parcel will be retained. To mitigate potential impacts on this feature, it will be necessary to include measures in a CEMP which set out how the pond will be protected during the construction phase. This should include, but not be restricted to:

- Sealing the pond off with Heras fencing with hessian mesh to protect from construction activity;
- Implementing dust suppression methods;
- Ensuring a spill response strategy is in place.

2.7.11 Potential also exists to enhance this pond as part of the construction phase.

Scattered Trees

2.7.12 Small numbers of scattered trees are expected to be lost as a result of the Proposed Development. Mitigation for this loss is proposed in the form of widespread replacement tree planting across the Hollingworth Road land parcel to provide a net gain in the number of trees.

Invasive species

2.7.13 There are some small patches of Himalayan balsam *Impatiens glandulifera* located around the barns/ farm complex, with potential for accidental spread of this species during the demolition of the buildings and grading of the surrounding land. This species should therefore be eradicated by specialist contractors prior to the demolition/ development works taking place around its location. Measure to remove the species can be controlled in an invasive species management plan, which can be secured through planning conditions.

Fauna

Badgers

2.7.14 The exact location of the off-site badger sett remains confidential. However, the sett will be retained and is approximately 31.5m from the nearest proposed works, and so no specific mitigation is required for the badger sett. A resurvey of the Hollingworth Road land parcel should be undertaken prior to development work commencing. If in the interim, badger setts have colonised elsewhere within the land parcel, or adjacent land that could be disturbed, suitable mitigation would need to be devised (such as closing new setts under licence, or redesigning areas to avoid new setts).

2.7.15 Aside from impacts on setts, sensitive working methodologies should be implemented during the construction phase to avoid accidental injury/ killing of this species. This can be controlled through a CEMP, and should include, but not restricted to, the following:

- All site materials to be stored off the ground on pallets;
- All woody vegetation removed to be stored in skips prior to chipping, or chipped immediately, with all arisings moved off-site;
- All excavations left open overnight to be sealed or with mammal ladders/ramps provided to allow any amphibians/small mammals which become trapped the opportunity to escape;
- Any pipework to be sealed overnight; and
- A toolbox talk provided to all contractors prior to works commencing to explain the legislation afforded to protected/notable species and what to do in the event of unexpected finds.

Bats

2.7.16 Loss of a confirmed bat roost is anticipated, due to the removal of the farmhouse (B1) during the construction phase. Due to the species and numbers recorded, the roost shall fall within the criteria for a 'low impact' mitigation class licence, which allows the damage of destruction of up to three 'low conservation status roosts'. The other buildings on-site did not contain bat roosts. It is considered likely that all buildings, other than B1, will continue to have no potential to support roosting bats so there is no recommendation for mitigation to this regard. For building B1, the following is recommended:

- Alternative bat roosts to be designed into the scheme, prior to the demolition of B1. This shall comprise artificial bat boxes, ideally located within close proximity to B1 – in locations such as the adjacent retained trees and integrated into the fabric of the houses on-site.
- A 'low impact' licence application to Natural England, and update surveys in the year of the application will need to be undertaken. Three nocturnal dusk emergence surveys are recommended on Building B1.

2.7.17 Mitigation for minor tree loss in the construction phase is considered to be adequate through the provision of wider tree planting across the Hollingworth Road land parcel. Some retained mature trees within the deciduous woodland block to the south-east of the land parcel would be suitable for enhancement works to create small natural crevice features within the trees, or artificial bat boxes can be installed. Due to the small number of trees proposed to be lost by the development, this level of mitigation is considered suitable for maintaining the functionality of the wider land parcel for bats. None of the trees proposed for removal provide potential roost features.

2.7.18 The Hollingworth Road land parcel is generally considered to be of low suitability for foraging and commuting habitat; however, habitat losses will be incurred during the construction phase. This would be mitigated through tree planting and other habitat enhancements within the green infrastructure of the Proposed Development. The majority of activity observed throughout the surveys concentrated at the land parcel's boundaries; these areas will largely be unlit and have opportunities for enhanced planting of scattered trees, hedgerows, neutral grassland planting and SuDS.

Breeding Birds

2.7.19 Of the four SoPI species recorded as either confirmed or probable breeders on-site, only lapwing breed in habitats which are to be impacted during the construction phase of the development. The remaining three species breed in boundary habitats which are largely to be retained.

- 2.7.20 Clearance of habitat during the construction phase which could contain breeding birds would be timed to avoid the bird breeding season wherever possible (i.e. conducted between September and February). Where this cannot be achieved, habitat clearance would need to be preceded by a check for active nests by a suitably qualified ecologist ('SQE'). Where an active nest is found, a suitable exclusion zone (commensurate with species concerned, tolerance of disturbance and stage of nesting) would be set up and left undisturbed until dependent young have fledged and a the SQE confirms the nests are no longer active. It should be noted that some species of bird (i.e. pigeons/doves) can nest year-round and the legislation afforded to wild bird nests is applicable year-round as well. Whilst there isn't a requirement for ecological supervision for vegetation clearance outside of the 'core' nesting season, due diligence should be shown by contractors for all vegetation clearance and if an active nest is suspected, work in the area should stop and advice sought from the SQE.
- 2.7.21 Although the overall loss of available nesting habitat for birds is minor, options exist to enhance the Hollingworth Road land parcel for a wider range of nesting species (including those of conservation concern) than currently exist within the land parcel. The northern portion of the land parcel provides large areas of open grassland, to be enhanced for ground nesting species. It is also recommended that a number of nest boxes should be installed on-site through a combination of boxes on retained trees and integrated within new buildings. The following specifications are recommended:
- Installation of 10 x boxes targeting house sparrow integrated in new buildings;
 - Installation of 10 x boxes targeting swift in new buildings; and
 - Installation of 10 x boxes targeting starling in new buildings and/or boundary trees.

Over-wintering Birds

- 2.7.22 The Hollingworth Road land parcel was found to provide unsuitable habitat for larger species of over-wintering birds, such as geese; the limited amount of tree cover, with no berry-bearing hedgerows within the centre of the land parcel, also provides unsuitable habitat for winter thrushes. Therefore adverse impacts upon over-wintering birds, arising from the construction phase, are considered unlikely. However, to mitigate minor habitat loss during construction, the detailed planting scheme includes berry-producing hedgerow and tree species, open areas of neutral grassland and SuDS creation; all of which will enhance the land parcel for over-wintering bird species.

Amphibians

- 2.7.23 Although pond P1 was found to be negative for great crested newt and shall be retained as part of the Proposed Development, adjacent habitats such as the rush grassland may provide some (although limited) terrestrial habitat for other notable amphibians, namely common toad. To this end, clearance of habitat, during construction, which could contain amphibians should be checked immediately prior to works commencing. This should include, but not be restricted to marshy grassland, and poor semi-improved grassland. The full extent of the proposed works should be agreed with the contractor and appointed SQE prior to commencement. Any 'no-work' areas should be clearly outlined and protected. Any amphibians found should then be moved to a receptor area in retained/ protected areas of the land parcel. Full details of clearance techniques should be provided within a CEMP. This approach would not allow for the capture of GCN within the land parcel but the risk of encountering GCN is considered to be exceptionally low given the lack of any evidence of the species from surveys.
- 2.7.24 The detailed CEMP should also include best-practice working methodologies to protect amphibians and other small mammals which may also cross the construction site once suitable habitat is cleared. These should include, but not be restricted to:
- All site materials to be stored off the ground on pallets;

- All woody vegetation removed to be stored in skips prior to chipping, or chipped immediately, with all arisings moved off-site;
- All excavations left open overnight to be sealed or with mammal ladders/raps provided to allow any amphibians/small mammals which become trapped the opportunity to escape;
- Any pipework to be sealed overnight; and
- A toolbox talk provided to all contractors prior to works commencing to explain the legislation afforded to protected/notable species and what to do in the event of unexpected finds.

Completed and Operational Development

- 2.7.25 The provision of a Landscape and Biodiversity Management Plan (LBMS) will contain the details of the management of existing habitats within the Hollingworth Road land parcel and those to be created or enhanced.

Statutory Designated sites:

- 2.7.26 **Rochdale Canal SAC:** is designated wholly for its populations of floating water plantain. In the absence of primary mitigation, the operational phase of the development could have a major adverse impact on this species and therefore the SAC.
- 2.7.27 Available research, summarised in the PfE HRA⁹, suggests that the species is known to be “*susceptible to nutrient enrichment from water-borne pollution*”.
- 2.7.28 In addition to water pollution, this species has been shown to be intolerant of competition⁹, likely through physical suppression, competition for light and nutrients and chemical suppression (such as allelotoxins).
- 2.7.29 Measures to mitigate the above factors during the operational phase include:
- **Water pollution/ sedimentation:** in accordance with the SuDS Manual (CIRIA 753) and the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) all sites should endeavour to achieve as close to pre-development greenfield rates as is viable. Based on the development area, the pre-development greenfield rate (QBar) is calculated to be 13.3l/s using the FEH Statistical Method. The proposals are therefore to restrict the surface water run-off to mimic the pre-development greenfield situation. This rate has been calculated based on the existing greenfield area (1.01ha) that currently discharges into the canal (See **Hydrology and Drainage Chapter 4**).
 - **Physical Damage/ Suppression:** The PfE HRA concluded that recreational pressure along the Canal will not have a harmful effect on the special interest of the Canal, as recreational activities have greatly increased in recent years along the Canal and the populations of *L. natans* have been seen to remain stable. No likely significant effects will arise as a result increased human activities/ recreational pressure. Boat moorings shall not be included as part of the proposed development, which would negate long-term effects on floating water plantain adjacent to the Hollingworth Road land parcel. Suppression from overshadowing and out-competing shall not occur as a substantial set-back of development has been embedded into primary mitigation. However, vegetation management of the Canal bankside shall be included as secondary mitigation, and controlled within the LBMS.
- 2.7.30 **South Pennine Moors SAC:** The PfE HRA⁹ describes the potential for airborne ammonia, nitrogen and acid deposition to “have only a marginal effect on the South Pennine Moors, and

⁹ Wilby & Eaton 1993, Greulich et al 2000b

would not result in any measurable reduction in the extent of blanket bog or other specified habitats". Therefore, impacts arising from airborne pollution during the operational phase are not anticipated.

- 2.7.31 There is potential for impacts resulting from increased recreational pressure on the SAC, as the Proposed Development comprises more than 50 houses – criteria set out within the PfE HRA⁸. The HRA comments that "the South Pennine Moors covers a very large area, and attracts visitors from a very wide area of Northern England... but the designated sites are only a part of the total area". Additionally, "there are a wide range of access points, and the road and footpath network extends to more than 140km... the wide range of alternative routes means that the disturbance can be more spread out, resulting in potentially lower overall impacts in any one location". The PfE HRA concludes that, as most visitors do not visit the core areas of the European site, it is considered unlikely that significant increases in adverse effects will arise simply from local population increases.
- 2.7.32 Although increased recreational impacts are considered unlikely to have a significant effect on the SAC, the Proposed Development would implement the following as mitigation:
- Residents are provided with information packs concerning alternative recreational areas and the importance of the South Pennine SAC;
 - Provide contributions to the local Nature Recovery Network, which could be part of the visitor management strategy which is being developed for the South Pennines, in partnership with surrounding relevant authorities.
- 2.7.33 **South Pennines Moore SPA:** designated for its breeding bird populations. The Hollingworth Road land parcel is not considered to be functionally linked to the SPA, and so species-specific mitigation is not required. Impacts arising from pollution from the operational phase are not considered likely, as described above for the SAC. Recreational pressures would be the same for the SPA as with the SAC, and therefore suitable mitigation in the form of access to alternative green infrastructure, resident information packs and contributions to a local Nature Recover Network.

Non-statutory Designated Sites:

- 2.7.34 Moderate adverse impacts arising from direct impacts such as light, noise and air pollution from the operational phase may result in habitat degradation. Measures to protect Rochdale Canal SAC and South Pennine Moors SAC/ SPA also applies to the Rochdale Canal SBI, Hollingworth Lake SBI and South Pennine Moors SBI.
- 2.7.35 A sensitive lighting scheme has been designed, so that light pollution from the land parcel to Hollingworth Lake SBI is minimised, and mitigation for noise pollution (**Volume 2: Chapter 9**) and air pollution (see **Volume 2: Chapter 8**) will ensure no significant adverse impacts on Hollingworth Lake SBI during operation.
- 2.7.36 No likely significant effects are considered for Rochdale Canal SBI from recreational pressure, as with the SAC. Hollingworth Lake SBI has well established, contained footpaths and infrastructure, and therefore impacts arising from increased recreational pressure are considered unlikely.

Habitats

- 2.7.37 Habitats retained and created as part of the green infrastructure of the Proposed Development would be subject to a LBMS. The LBMS should also contain measures to prevent degradation of retained broadleaved woodland, trees and pond during site management and from human activity and to further enhance their value with the adoption of a LBMS.

2.7.38 Management of habitats would take account of ecological constraints regarding species such as:

- Badgers – consideration for badger, including installation of badger signs at strategic locations to indicate the risk of encountering badgers, along with road bumps to slow traffic down in targeted areas (such as roads to the north of the Hollingworth Road land parcel).
- Breeding birds – vegetation clearance would be timed to avoid the bird breeding season unless inspected and declared clear by a qualified ecologist (March to August inclusive);
- Amphibians – aquatic habitat works (i.e. to attenuation features) would be timed to avoid the breeding period (March to August inclusive) and work involving the clearance of vegetation at ground level should involve pre-clearance checks, with individuals being moved out of harm's way where necessary before starting work; and
- Hedgehog – work involving the clearance of vegetation at ground level should involve pre-clearance checks for hedgehogs with them being moved out of harm's way where necessary before starting work.

Fauna

Badgers

- 2.7.39 Once the Proposed Development is operational and construction works have ended, the physical barrier demarcating the 20m buffer would be removed and the entire embankment which hosts the sett would be available for badgers to excavate new setts within. Potential impacts relate to inappropriate management and increased risk of road traffic incidents through new roads in proximity to the retained setts and along known badger dispersal corridors, although none appear to be significant in the Hollingworth Road land parcel. The details of appropriate management should be detailed in a LBMS for the land parcel, which would detail how habitat management in proximity (i.e. cutting of grassland) would be completed in a manner sensitive to badgers (i.e. with appropriate machinery in daylight hours).
- 2.7.40 Mitigation for the potential increase in road traffic incidents could be achieved through the installation of badger signs at strategic locations to indicate the risk of encountering badgers, along with road bumps to slow traffic down in targeted areas (such as roads to the north of the land parcel).

Bats

- 2.7.41 To mitigate potential impacts through increased and insensitive lighting on the local bat population, a sensitive lighting scheme will be implemented which will ensure that favourable habitat/new roost sites (south of the Hollingworth Road land parcel and habitat surrounding the off-site pond in particular) are not subject to lighting levels above 1 lux.
- 2.7.42 This should include unlit areas within the green infrastructure, between the eastern and western portions of the development, providing dark corridors and dark spaces allowing connectivity across the wider landscape.

Breeding Birds

- 2.7.43 Any bird boxes provided in communal/public spaces as mitigation for the loss of nesting opportunities would be subject to a maintenance / cleaning regime which would also be set out in the LBMS. In addition to the above, the proposed green infrastructure layout for the Proposed Development would include planting which would provide suitable breeding habitat for birds.

Over-wintering Birds

- 2.7.44 Management of created habitats must be done sensitively in order to maintain the value of new planting for wintering bird species. This should be done through the control of a LBMS, which will detail that cutting of berry-producing hedgerows/trees should only be done in January/February, to give time for thrushes (most notably redwing and fieldfare) to forage upon the berries in early winter/late autumn.
- 2.7.45 The LBMS must also ensure that management across the entire land parcel is undertaken on a rotational basis, particularly in relation to hedgerows. This will ensure that birds will retain continuous access to dense, unmanaged hedgerows which are particularly important for foraging and shelter for all bird species.

2.8 Likely Residual Effects of the Development and their Significance

- 2.8.1 Residual impacts after mitigation that would result from the construction and operational phase of the development are summarised in **Table 2.5** below.

Table 2.5 Likely Residual Effects of the Proposed Development and their Significance

Description of Feature	Potential effect including significance, prior to the implementation of secondary mitigation measures	Secondary Mitigation	Residual Effect including significance
Demolition and Construction			
<i>Designated Sites</i>			
Rochdale Canal SAC (International)	Excess dust, litter, (Minor adverse)	Adoption CEMP	Negligible
South Pennine Moors SAC (International)	None	None required	None
South Pennine Moors SPA (International)	None	None required	None
Rochdale Canal SBI (County)	Excess dust, litter (Minor adverse)	Adoption CEMP	Negligible
Hollingworth Lake SBI (County)	Excess noise, dust and water pollution (Moderate adverse)	Adoption of CEMP	Negligible
All other LWS (County)	Air pollution (Moderate adverse)	Adoption of CEMP	Negligible
<i>Habitats and Flora</i>			
Amenity grassland (Negligible)	Removed during construction phase (Negligible)	None as negligible ecological importance	None

Description of Feature	Potential effect including significance, prior to the implementation of secondary mitigation measures	Secondary Mitigation	Residual Effect including significance
Broadleaved Woodland (Local)	Degradation of retained habitats from pollution during the construction phase and accidental damage. (Minor adverse)	Adoption of CEMP	Negligible
Built Form and Hardstanding (Negligible)	Removed during construction phase (Negligible)	None as negligible ecological importance	None
Improved grassland (Negligible)	Removed during construction phase (Negligible)	None as negligible ecological importance	None
Marshy grassland (Negligible)	Removed during construction phase (Negligible)	None as negligible ecological importance	None
Native Hedgerow with Trees (Local)	Degradation of retained habitats from pollution during the construction phase and accidental damage. (Minor adverse)	Adoption of CEMP	Negligible
Pond (Local)	Degradation of the pond from pollution during the construction phase and accidental damage. (Minor adverse)	Adoption of CEMP	Negligible
Scattered Broadleaved Trees (Local)	Minor tree loss expected and incidental damage/ impacts to retained trees (Minor adverse)	Replacement tree planting of a greater quantity plus implementation of tree protection measures	Minor beneficial
Poor semi-improved grassland (Negligible)	Removed during construction phase (Negligible)	None as negligible ecological importance	None
Species-poor defunct native hedgerow (Negligible)	Removed during construction phase (Negligible)	None as negligible ecological importance	None
Tall Ruderal Vegetation (Negligible)	Removed during construction phase (Negligible)	None as negligible ecological importance	None

Description of Feature	Potential effect including significance, prior to the implementation of secondary mitigation measures	Secondary Mitigation	Residual Effect including significance
<i>Protected and Priority Fauna</i>			
Badgers (Local)	Incidental killing/ injury during Site clearance. Disturbance of badger while using a place of shelter (Minor adverse)	Pre-commencement inspection of Site, along with adoption of any necessary mitigation.	Negligible
Bats (Local)	Destruction of known common pipistrelle roost at B1. Disruption to foraging and commuting routes (Minor adverse)	Roost removed under NE low impact class licence. New bat roosting features incorporated (natural on retained trees and artificial boxes). Adoption of CEMP including sensitive lighting plan.	Minor beneficial
Breeding Birds (Local)	Damage/destruction to active nests and minor loss of available nesting habitat (Minor adverse)	Sensitively timed works and inclusion of nest boxes targeting species of conservation concern	Minor beneficial
Over-wintering birds (Negligible)	None	No mitigation required, newly created habitats in the construction phase will provide benefit, particularly for winter thrushes	Minor beneficial
Amphibians (Local)	Incidental killing/injury during Site clearance (Negligible)	Adoption of CEMP including sensitive working techniques. Additional SuDS provided as part of the Proposed Development could provide enhanced habitat for amphibians.	Minor beneficial
Hedgehog (Local)	Incidental killing/injury (Minor adverse)	Adoption of sensitive habitat clearance techniques in CEMP	Negligible
Brown Hare (Local)	None	Site is considered unsuitable, but records of Hare in the local area, adoption of sensitive habitat clearance techniques in CEMP	Negligible

Description of Feature	Potential effect including significance, prior to the implementation of secondary mitigation measures	Secondary Mitigation	Residual Effect including significance
Completed Development			
<i>Designated Sites</i>			
Rochdale Canal SAC (International)	Risk of degradation and suppression (out-shaded, outcompeted by other species) (Minor adverse)	Embedded primary mitigation in the form of a substantial buffer shall avoid impacts arising from development suppression, the LBMS would include secondary measures to eradicate tall growing bankside species which may over-shade the Canal. SuDS planted with natural filtration species to mitigate potential for pollution entering the Canal, to be controlled through LBMS.	Negligible
South Pennine Moors SAC (International)	Risk of degradation as a result of human disturbance through increased recreational pressure. (Major adverse)	Mitigation through providing high quality green infrastructure within the Hollingworth Road land parcel and direct access to alternative green infrastructure (Rochdale Canal and Hollingworth Lake) Information packs provided to residents. Contributions made to Nature Recovery Network.	Negligible
South Pennine Moors SPA (International)	Risk of degradation as a result of human disturbance through increased recreational pressure. (Major adverse)	Mitigation through providing high quality green infrastructure within the Hollingworth Road land parcel and direct access to alternative green infrastructure (Rochdale Canal and Hollingworth Lake) Information packs provided to residents. Contributions made to Nature Recovery Network.	Negligible

Description of Feature	Potential effect including significance, prior to the implementation of secondary mitigation measures	Secondary Mitigation	Residual Effect including significance
Rochdale Canal SBI (County)	Risk of degradation as a result of air and water pollution, and suppression (out-shaded, outcompeted by other species and structures) (Moderate Adverse)	Embedded mitigation in the form of a substantial buffer shall avoid impacts arising from suppression, the LBMS would include measures to eradicate tall growing bankside species which may over-shade the Canal. Robust drainage filters and SuDS planted with natural filtration species to mitigate potential for pollution entering the Canal, to be controlled through LBMS.	Negligible
Hollingworth Lake SBI (County)	Risk of degradation as a result of noise, air and water pollution. (Moderate Adverse)	Adoption of sensitive lighting scheme and LBMS to mitigate air and water pollution	Negligible
All other SBI (County)	Risk of degradation as a result of human disturbance through increased recreational pressure (Moderate Adverse)	Mitigation through providing high quality green infrastructure within the land parcel. Information packs provided to residents. Contributions made to Nature Recovery Network.	Negligible
<i>Habitats and Flora</i>			
Amenity grassland (Negligible)	Removed during construction phase (Negligible)	None	None
Broadleaved Woodland (Local)	Degradation of retained habitats from human disturbance and inappropriate management (Minor Adverse)	Adoption of LBMS to provide management prescriptions.	Negligible
Built Form and Hardstanding (Negligible)	Removed during construction phase (Negligible)	None	None
Improved grassland (Negligible)	Removed during construction phase (Negligible)	None	None

Description of Feature	Potential effect including significance, prior to the implementation of secondary mitigation measures	Secondary Mitigation	Residual Effect including significance
Marshy grassland (Negligible)	Removed during construction phase (Negligible)	None	None
Native Hedgerow with Trees (Local)	Degradation of retained habitats from human disturbance and inappropriate management (Minor Adverse)	Adoption of LBMS to provide management prescriptions and enhance habitat value through species planting	Minor beneficial
Pond (Local)	Degradation of retained habitats from human disturbance and inappropriate management (Minor adverse)	Adoption of LBMS to enhance habitat value	Minor beneficial
Scattered Broadleaved Trees (Local)	Degradation of retained habitats from human disturbance and inappropriate management (Minor adverse)	Adoption of LBMS to maintain habitat value	Negligible
Poor semi-improved grassland (Negligible)	Removed during construction phase (Negligible)	None	None
Species-poor defunct native hedgerow (Negligible)	Removed during construction phase (Negligible)	None	None
Tall Ruderal Vegetation (Negligible)	Removed during construction phase (Negligible)	None	None
<i>Protected and Priority Fauna</i>			
Badgers (Local)	Disturbance impacts from increased recreational pressure and risk of mortality associated with increased roads or disturbance from inappropriate management (Negligible)	Adoption of sensitive lighting scheme Ensuring public cannot access off-site area where badger setts are located.	Negligible
Bats (Local)	Disturbance to known commuting areas/roost sites in developed Site as a result of increased/insensitive lighting (Minor adverse)	Adoption of sensitive lighting scheme and Maintenance/ management of boxes in public/communal areas	Minor beneficial

Description of Feature	Potential effect including significance, prior to the implementation of secondary mitigation measures	Secondary Mitigation	Residual Effect including significance
Breeding Birds (Local)	Disturbance of retained and created habitats and impacts on active nests through management (Minor adverse)	Adoption of sensitive vegetation management techniques in LBMS for Site. Maintenance/ management of boxes in public/communal areas	Minor beneficial
Over-wintering birds (Negligible)	Disturbance of retained and created habitats and impacts on active nests through management (Minor adverse)	Adoption of sensitive vegetation management techniques in LBMS for the land parcel. Maintenance/ management of boxes in public/communal areas	Minor beneficial
Great Crested Newt and other Amphibians (Local)	Disturbance impacts from pond and SuDS maintenance and risk of mortality associated with gulley pots (Negligible)	Sensitively timed works for created SuDS and installation of amphibian-friendly gulley pots around the land parcel.	Minor beneficial
Hedgehog (Local)	Risk of disturbance and killing/injury through habitat management (Minor adverse)	Adoption of sensitive vegetation management techniques in LBMS for the land parcel and inclusion of hedgehog highways	Negligible
Brown Hare (Local)	None	The Hollingworth Road land parcel is considered unsuitable, but records of Hare in the local area, adoption sensitive vegetation management techniques in LBMS	Negligible

Conclusion

2.8.2 The ecological assessment has completed an appraisal of the potential impacts on features of ecological importance within the potential Zone of Influence of the Proposed Development. Most significantly, this comprised:

- The presence of nearby sites of **International importance**, which will be mitigated through the adoption of sensitive working strategies outlined in a CEMP and long-term strategies to mitigate impacts arising from the operational phase of the Proposed Development, through appropriate drainage strategies; access to existing extensive alternative greenspace, such as Rochdale Canal and Hollingworth Lake; the creation of accessible green infrastructure within the Proposed Development and contributions to a local nature recovery fund;

- Retained habitats of **Local importance**, to be protected through a CEMP in the construction phase, while being enhanced through additional green infrastructure, controlled in a LBMS;
 - The presence of a bat roost of **Local importance**, which will be mitigated through licensable works, post-consent, and enhanced through the installation of replacement bat boxes; and
 - The presence of an off-site badger sett of **Local importance**, which will be mitigated through appropriate buffers and landscaping to provide continued suitable habitat.
- 2.8.3 No ecological constraints have been identified that would prevent the development being in compliance with relevant wildlife/nature conservation legislation and policy as long as the mitigation measures discussed in this report are implemented in full.
- 2.8.4 It is considered that these mitigation measures can be secured through appropriately worded planning controls, including the preparation of an ecological enhancement strategy (detailing bird/bat box provisions), adherence to a CEMP and LBMS. Opportunities also exist to enhance the land parcel's value to certain species groups through the inclusion of the following measures:
- Installation of widespread bat roost boxes;
 - Installation of widespread bird nest boxes; and
 - Bringing retained habitats into better condition and more favourable management.

2.9 Assessment of Cumulative Effects and their Significance

- 2.9.1 Please refer to Volume 1: Chapter 10 for the assessment of cumulative effects and their significance for the Hollingworth Road land parcel and the Rakewood Road land parcel.

2.10 Summary

Baseline Conditions

- 2.10.1 The Hollingworth Road land parcel was found to contain habitats largely of negligible ecological importance (such as heavily grazed farming fields). A full suite of ecological protected species surveys was undertaken. Surveys found there to be no GCN presence within pond P1, a badger sett marginally off-site, a small common pipistrelle bat roost in the farm building, low levels of bat activity across the land parcel and largely common and widespread breeding birds (most notably, one breeding pair of lapwing).

Construction Phase Effects

- 2.10.2 Minor adverse anticipated effects on the Rochdale Canal SAC, with embedded primary mitigation including a robust drainage strategy for run-off during the construction phase, with secondary mitigation such as dust and litter prevention, controlled through a CEMP. Residual effects being negligible.
- 2.10.3 Moderate adverse effects on Hollingworth Lake SBI, through noise (disturbance of birds at the Lake), air and water pollution created during construction could impact the SBI. Residual effects being negligible.
- 2.10.4 Minor adverse effects on some habitats, namely broadleaved woodland, hedgerow, off-site pond, scattered trees. Residual effects being negligible.

- 2.10.5 Minor adverse effects on species such as badger, bats, breeding birds, amphibians. Residual effects being negligible.

Operational Phase Effects

- 2.10.6 Minor adverse effects on the Rochdale Canal SAC, SBI, with the 'primary' mitigation measures embedded (drainage strategy, substantial buffer, SuDS) potential impacts arising from water pollution and overshadowing at the operational phase are anticipated to be of a minor impact magnitude. Residual effects being negligible following secondary mitigation.
- 2.10.7 Major adverse effects on South Penning Moors SAC, SPA; primary mitigation (green infrastructure) will minimise impacts arising from recreational pressure, and secondary mitigation in the form of home owner packs and contributions to local recovery networks will result in residual effects being negligible.
- 2.10.8 Moderate adverse effects on Hollingworth Lake SBI through noise and air pollution created during the operation phase. Residual effects anticipated to be negligible through noise and air quality strategy.
- 2.10.9 Minor adverse effects on broadleaved woodland, hedgerows, scattered trees and off-site pond through mis-management and accidental damage. Residual effects likely to be negligible through adoption of LBMS.
- 2.10.10 Minor adverse effects on badger, bats, breeding birds and amphibians through mis-management of habitats and accidental killing. Residual effects likely to be negligible through adoption of LBMS

2.11 References

- Bibby, C.J., Burgess, N.D., Hill, D.A. and Mustoe, S.H. (2000). Bird Census Techniques. Academic Press
- Chartered Institute of Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland.
- Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.
- Cresswell, P., Harris, S. and Jefferies, D. (1990) The history, distribution status and habitat requirements of the badger in Britain. Nature Conservancy Council, Peterborough.
- Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin.
- Design Manual for Roads and Bridges, Volume 10 – Environmental Design and Management; Section 4 – Nature Conservation. Part 4 (HA 81/99) – Nature Conservation Advice in Relation to Otters
- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods: A Manual of Techniques for Key UK Species. RSPB.
- Great Crested Newt Mitigation Guidelines (2001), English Nature.
- Harris, S., Cresswell, P. & Jeffries, D., 1989. Surveying Badgers – Mammal Society Publication No.9. London: Mammal Society.

- Herpetofauna Workers' Manual (2003) Gent, T & Gibson, S. <http://jncc.defra.gov.uk/page-3325>
- Joint Nature Conservation Committee (2010). Handbook for Phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough.
- Mitchell-Jones, A.J. (2004). Bat Mitigation Guidelines. English Nature, Peterborough.
- Mitchell-Jones, A.J. and McLeish, A.P. (2004). Bat Workers' Manual. 3rd Edition. JNCC, Peterborough.
- Wilson, G., Harris, S. and McLaren, G. (1997) Changes in the British badger population, 1988 to 1997. People's Trust for Endangered Species (PTES), London.
- Department for Environment, Food and Rural Affairs (DEFRA) (1991) The Water Resources Act, HMSO, London.
- Statutory Instrument 2005 No. 895 (2005) The List of Wastes (England) Regulations, HMSO, London.

3 Landscape and Visual

3.1 Introduction

- 3.1.1 This chapter of the ES assesses the likely significant effects of the Proposed Development on the environment in respect of landscape and visual amenity and has been prepared by a Chartered Member of the Landscape Institute with over 15 years' experience in landscape and visual impact assessment ('LVIA').
- 3.1.2 The chapter has been prepared by Stantec Landscape Planning and Design, a registered practice of the UK Landscape Institute (membership number 897) and an Institute of Environmental Management and Assessment ('IEMA') EIS Quality Mark Registrant, in accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided within Volume 1: Appendix D.
- 3.1.3 The chapter describes the planning policy framework relevant to landscape and visual amenity matters; the assessment methodology; the baseline conditions of the Hollingworth Road land parcel and its wider surroundings; the likely significant environmental effects; the additional mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed (both primary and secondary); and the likely cumulative effects with other schemes.
- 3.1.4 The following Figures are appended to support this chapter (Appendix B.1):
- Figure 3.1: Site Context Plan;
 - Figure 3.2: Topographical Features Plan;
 - Figure 3.3: Landscape Character Plan;
 - Figure 3.4: Site Appraisal Plan;
 - Figure 3.5: Visual Appraisal Plan; and
 - Figure 3.6: Opportunities and Constraints Plan.
- 3.1.5 This chapter should also be read in conjunction with the following Appendices:
- Appendix B.2: Landscape and Visual Impact Assessment Methodology;
 - Appendix B.3: Landscape Effects Table;
 - Appendix B.4: Site Appraisal Photographs (WINTER);
 - Appendix B.5: Site Context Photographs (WINTER);
 - Appendix B.6: Site Appraisal Photographs (SUMMER);
 - Appendix B.7: Site Context Photographs (SUMMER); and
 - Appendix B.8: Visual Effects Table.

3.2 Policy Context, Legislation, Guidance and Standards

National Policy

National Planning Policy Framework (2023)

- 3.2.1 The NPPF (last updated in December 2023) promotes a presumption in favour of sustainable development, providing that it is in accordance with the relevant up-to-date local plan and policies set out in the NPPF. Paragraph 9 notes that planning policies and decisions should also take local circumstances into account to reflect the character, needs and opportunities of each area.
- 3.2.2 Section 12 of the NPPF focuses on achieving well-designed spaces and seek to promote good design in the built environment. In particular, Paragraph 139 states that planning permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way that it functions.

Planning Practice Guidance (regularly updated)

- 3.2.3 To support the implementation of the policies of the NPPF, the Government regularly updates the Planning Practice Guidance ('PPG'), which provides up-to-date advice and guidance. Those overarching topics of most relevance to landscape and visual matters include: 'Design - process and tools', and 'Natural Environment'.
- 3.2.4 Within the Design section of the PPG, Paragraph 001 is the fundamental building block to good design and directs attention to the National Design Guide as a means of shaping places in both plan-making and decision-taking. Paragraph 010 refers to how design should be considered in outline planning applications, with Paragraph 011 providing additional commentary in relation to the role of parameter plans. The PPG suggests that, in some instances, a Design Code may be appropriate to help inform future detailed design for outline proposals as part of a wider clear design vision.
- 3.2.5 Under the Natural Environment section of the PPG, the topic of green infrastructure is considered, with Paragraph 006 recognising the contribution that green infrastructure makes in building a strong and competitive economy, achieving well-designed places that promote healthy and safe communities, and in both considering and enhancing the natural environment including facilitating biodiversity net gain. The topic of landscape is also considered within the same section of the PPG, with Paragraph 037 advocating a landscape character approach to the assessment of landscape and visual effects.

Local Planning Policy

Rochdale Adopted Core Strategy (2016)

- 3.2.6 The adopted Rochdale Core Strategy sets out the long-term spatial strategy for the future development of the Borough until 2028, and it aims to address key priorities set out within various strategies and plans, including the Sustainable Community Strategy. Some of the policies within the Core Strategy have been wholly or partially replaced by policies within the recently adopted PfE Plan, as detailed by Table A.5 within Appendix A to the PfE Plan. For instance, Core Strategy Policy G4 ('Protecting Green Belt land') is superseded by PfE Policy JP-G9 ('The Green Belt').
- 3.2.7 Policies and other key content from the Core Strategy that is relevant to the Hollingworth Road land parcel and the proposed development, and which has not been superseded by the PfE Plan, is highlighted below:

3.2.8 Strategic Objective 4 aims to help deliver a greener environment:

“SO4 - To promote a greener environment

To do this we will focus on:

Minimising Rochdale’s contribution to climate change and mitigating and adapting to its adverse effects;

Ensuring in particular that development is energy efficient and contributes to carbon reduction;

Reducing the likelihood of flooding through appropriate flood risk management, especially in Rochdale town centre and parts of Littleborough and Heywood;

Improving our urban open spaces and making them more accessible;

Maximising the value of our green open areas and countryside to provide opportunities for recreation, amenity, biodiversity and flood management;

Minimising and managing waste and managing minerals resources sustainably; and

Ensuring no detriment to the conservation interests of European and other protected natural sites.”

3.2.9 Policy P1 notes that improving the Borough’s image will result in social and economic benefits, thus attracting investment:

“P1 - Improving image

We will require high quality design in all new developments, and this will be particularly important in the following areas, which are crucial to the image of the borough:...

We will ensure new development improves the image of the borough by:

- a. Requiring design which is of a high standard, demonstrating innovation and originality;...*
- b. Helping to ‘green’ the urban environment, for example by securing tree planting on sites and along streets and roads;...”*

3.2.10 Policy P2 notes that enhancing and protecting the Borough’s character can lead to an improved quality of life and boost the economy, and in turn investments:

“P2 - Protecting and enhancing character, landscape and heritage

1. We will protect and enhance the borough’s character, the distinctiveness of its town centres, housing areas and countryside, and the qualities of its landscapes, utilising the considerable potential of these assets in development and regeneration schemes. We will do this by:

- a. Requiring new development to integrate successfully with the key natural features of the borough, e.g. river valleys and the Pennine landscape;*
- b. Requiring new development to take opportunities to protect and open up important views of hills and valleys which are part of the borough’s unique character;*
- c. Restoring the River Roch and other water bodies to their place as key and attractive features of the borough, including opening up waterways where they have been covered, and enhancing their setting, heritage assets and biodiversity potential;*

- d. *Protecting, enhancing and utilising outstanding cultural landscapes, such as the Cheesden Valley area and around Littleborough and Hollingworth Lake; and*
- e. *Conserving and enhancing townscape character....”*

3.2.11 Policy P3 notes that good design will improve the attractiveness of the Borough, and can also improve health and safety of the environment:

“P3 - Improving design of new development

We will require all new developments, including associated landscaping, regardless of location in the borough, to adhere to high standards of design. The following design principles should be adhered to wherever relevant:

- *Enhance the borough’s identity and sense of place, by respecting context where it is positive and having regard to the scale, density, massing, height, layout, landscape, materials and access of surrounding buildings and areas in general;*
- *Ensure that buildings contribute positively to the townscape, and are well proportioned;*
- *Incorporating design measures that design out crime and ensure developments and spaces are safe to use and access (including lighting as appropriate);*
- *Provide an appropriate mix of uses and consider the needs of all sections of society;*
- *Ensure a development is easy to move through and get around, especially for pedestrians, cyclists, public transport, disabled people and emergency service vehicles;*
- *Provide a hierarchy of routes, streets and spaces, relating positively to visual connections between the development and its surroundings;*
- *Ensure that the intended functions of buildings and spaces are easily understood, and their entrances appropriately located and visible;*
- *Ensure buildings can be easily adapted to meet future/alternative needs of occupants;*
- *Minimise impact upon the environment, and help adapt to the impacts of climate change, including by re-using existing buildings and materials (maximising the benefits of existing embodied energy) and utilising sustainable drainage (Policies G1 and G2);*
- *Design buildings and spaces so that quality and appearance can be maintained over time; and*
- *Reduce the monotony and visual impact of car parking areas by using substantial and well integrated landscaping...”*

3.2.12 Policy G6 notes that enhancing green infrastructure will help by protecting the Borough from flooding and climate change impacts, and in turn will provide a better quality of life via better access to nature and healthier lifestyles:

“G6 - Enhancing green infrastructure

We will sustain and enhance a green network to support growth and regeneration in the borough and provide a high-quality environment that meets the needs of our community and visitors to the borough. We will protect and improve green spaces and water bodies and ensure that their value to sustainable development and regeneration is maximised. Our priorities are to improve opportunities for recreation in urban areas and the

countryside, improve opportunities for healthy lifestyles, and to help manage and respond to environmental risks such as flooding and the impacts of climate change. We will also ensure that the network supports the sustainable growth of the Greater Manchester city region and links with a wider Greater Manchester strategic green infrastructure network.

We will protect, improve and create green infrastructure to help deliver strategic sustainable development priorities and meet local needs in the following locations:

....

- 4. Other river valleys and green corridors where the focus will be on enhancing recreational links between urban areas and open countryside to allow passage of wildlife, provide local opportunities for recreation, improving visual amenity, and contribution to local and wider environmental management e.g. reducing air pollution and managing flood risk.*
- 5.. Other water bodies (lakes, streams, reservoirs, ponds etc) where the focus will be on celebrating water and promoting water features as a key characteristic of the local landscape, to improve their recreational and biodiversity value, maximise their potential for flood risk management and to incorporate water features (existing and new) as part of new developments, public realm initiatives, town centre design and neighbourhood regeneration initiatives where practicable.*
- 6. Rochdale Canal corridor where the focus will be on promoting the use of the canal for navigation, protecting and conserving its nature conservation value, improving linkages to the National Cycle Route 66 (Connect 2) cycle route with visitor, employment and neighbourhood destinations and securing environmental improvements as part of canalside development.*
- 7. Countryside around towns where the focus will be on reclaiming derelict land, woodland planting and improvement, creating and improving paths and cycle networks to link town and country, promoting access to nature, improving flood risk management and maintaining a strong green belt.*
- 8. Local urban open spaces where the focus will be on improvements to the quality of accessible greenspace close to where people live and work (prioritising those areas with the greatest deficiency or need e.g. poor health or lack of private gardens), securing tree planting and other urban greening in new areas of public open space in town centres and housing growth areas, protecting allotments and supporting local food growing, enhancing flood risk management and protecting and improving urban wildlife value and natural areas.)*
- 9. Urban areas and new development where the focus will be on incorporating green infrastructure into new development, sustainable urban drainage, increasing the number of street trees, greening housing areas and main roads, developing new green spaces, and incorporating green roofs and walls in new development.*

We shall take into account local and national planning policy requirements when considering the appropriateness of development proposals that may affect sports, recreation and open space provision. A Green Infrastructure Strategy for the borough and Green Infrastructure Action Plans for each Township will inform and support area based masterplans and initiatives, development proposals and associated developer contributions, regeneration programmes and environmental management schemes.

We will expect development proposals and other proposals affecting green infrastructure to:

- d. be consistent with the above focus for green infrastructure and the wider than local value that green infrastructure can have;*

- e. have regard to local landscape character and contribute to its conservation or enhancement;*
- f. avoid the loss of existing urban greenspace or features e.g. trees unless suitable alternative provision is made, it has limited value, and its development or change of use will help to meet other sustainability or local regeneration objectives;*
- g. in the case of residential development, provide or contribute financially towards recreational open space, including maintenance, in accordance with the standards set out in the Provision of Recreational Open Space in New Housing Supplementary Planning Document (SPD);*
- h. take opportunities to improve access to, and the provision of, natural greenspace in accordance with local strategies and standards*
- i. take opportunities to secure innovative solutions to the design of urban open space to widen its potential functions e.g. flood risk management, promoting urban wildlife or climate change adaptation;*
- j. not sever, or impede the key functions of designated greenspace corridors or river valleys, or detract from their natural, visual or recreational quality, but enhance their value and accessibility;*
- k. protect ancient woodlands and hedgerows, support new woodland and tree planting in new developments, and replace removed trees from a site at a ratio of 2:1; and*
- l. take opportunities, where feasible, to improve the water quality and biodiversity of water bodies and their environs in compliance with the Water Framework Directive or equivalent.*

Supplementary Planning Documents

Design and Planning Process A Guide to Good Practice

- 3.2.13 The 'Design and Planning Process: A Guide to Good Practice' aims to assist all those involved in the process of designing and constructing buildings, streets and spaces to create good quality places. The SPD complements the series of Design Guides which has been produced jointly by Oldham Metropolitan Borough Council, Rochdale Metropolitan Borough Council, and the Oldham Rochdale Partners in Action Housing Market Renewal.

Oldham and Rochdale Urban Design Guide

- 3.2.14 The 'Urban Design Guide' expands on local planning policies and sets design principles for all types of development with the Boroughs of Oldham and Rochdale. These principles identify what should be done to achieve design quality. The following guides provide more detail on how the principles set out in this Urban Design Guide should be achieved:
- the Residential Design Guide;
 - the Public Realm Design Guide; and
 - the Design and Planning Process: Guide to Good Practice.

Residential Design Guide

- 3.2.15 The 'Residential Design Guide' forms one part of a series of Design Guides produced jointly by Oldham Metropolitan Borough Council, Rochdale Metropolitan Borough Council, and the Oldham Rochdale Partners In Action Housing Market Renewal. Its aim is to provide clear

guidance to everyone involved in development (including architects, designers, public and private sector developers, house builders and engineers) on the quality of design expected by both Boroughs. The Guide is used by local authority officers to help assess the quality of planning applications.

Rochdale Town Centre Conservation Area

- 3.2.16 Rochdale has a Conservation Area map but no Conservation Area Appraisal to accompany the document.

Pennines Green Infrastructure Action Plan July 2012

- 3.2.17 The Pennines Green Infrastructure Action Plan states that it will be delivered through four long term strategic projects that will help to deliver high quality green infrastructure where it is needed most. The Hollingworth Road land parcel is located within Character Area 4: Hollingworth Lake and Environs.

3.3 Assessment Methodology

Introduction

- 3.3.1 The Landscape and Visual methodology has been drawn from best practice guidance and the Guidelines for Landscape and Visual Impact Assessment, Third Edition (2013). The aim of these guidelines is to set high standards for the scope and content of landscape and visual impact assessments and to establish certain principles that will help to achieve consistency, credibility, transparency and effectiveness throughout the assessment.
- 3.3.2 The assessment of landscape and visual effects, in common with the assessment of many environmental effects, includes a combination of objective and subjective judgements, and it is therefore important that a structure and consistent approach is adopted to ensure that the assessment undertaken is as objective as possible.
- 3.3.3 A landscape assessment is the systematic description and analysis of the features within the landscape, such as landform; vegetation cover; settlement pattern; building forms; transport patterns; and land use; which create a particular sense of place. A visual assessment considers visual receptors, which are the viewers of and within the landscape, and includes locations such as residential and business properties; public buildings; transport routes; Public Rights of Way ('PRoW') and public open space.
- 3.3.4 The significance of effect thresholds for landscape and visual effects is determined by considering the sensitivity of the receptor concerned alongside the magnitude of effect that will be experienced. The landscape and visual methodology is set out in full within Appendix B.2.

Study Area

- 3.3.5 The study area for this assessment broadly equates to the extents shown in Appendix B.1, Figure 3.1: Site Context Plan.

Limitations and Assumptions

- 3.3.6 Limitations of the assessment include:
- The assessment uses the year 2025 as the 'baseline year' (unless otherwise stated). Impacts arising from enabling works/site clearance works are highlighted where appropriate along with mitigation measures;

- The assumed year for completion of the Proposed Development will be 2031. It is expected that the construction programme will commence in 2025 and be completed over approximately 6 years;
- Baseline conditions have been established from a variety of sources, including historical data. Due to the dynamic nature of certain aspects of the environment, conditions may change during the construction and operation of the scheme;
- During visits to the Hollingworth Road land parcel and the surrounding area, weather conditions, the time of day and seasonal factors have influenced the visual assessment and photographic record of the environment; and
- Access to private properties has not been obtained, nor has access to the north-western part of the Hollingworth Road land parcel been obtained due to operational constraints at the time of survey.

3.3.7 Assumptions in the assessment include:

- Information provided by third parties, including publicly available information is correct at the time of publication;
- During the construction phase, tall plant and machinery will be in place for the minimum practicable period of time;
- The landscape proposals will be implemented in accordance with best practice guidance and benefit from the appropriate long-term maintenance; and
- With respect to judgements on landscape and visual susceptibility, the nature/form of the type of development proposed should be read as a mixed-use residential settlement comprising built form up to a maximum height of 17m.

3.4 Consultation

3.4.1 In relation to the proposals for residential development and a primary school at Hollingworth Road, an EIA Screening Opinion Request was submitted to RBC in July 2019 (ref. 19/00910/SO). We received RBC's EIA Screening Opinion in January 2020. Additionally, an EIA Scoping Opinion Request was submitted in February 2023 (ref. 23/00169/SCO). RBC provided its EIA Scoping Opinion in relation to these proposals in July 2023. At that time, the proposal was to submit a standalone application for the Proposed Development at the Hollingworth Road land parcel.

3.4.2 An updated EIA Scoping Report was submitted to RBC in May 2024, the purpose of which is to consider the addition of the Rakewood Road land parcel as part of the EIA.

3.5 Baseline Conditions

Site Context

Location and Land Use

- 3.5.1 The Hollingworth Road land parcel comprises 18.85 hectares (ha) of land to the immediate west of Hollingworth Road, to the north-east of Smithy Bridge and south of Littleborough, in the north-eastern part of Rochdale, Greater Manchester. The Hollingworth Road land parcel is centred approximately at National Grid Reference SD 93341 15448.
- 3.5.2 The Hollingworth Road land parcel is bounded to the north by the former Akzo Nobel site and the Rochdale Canal, beyond which is a railway line. The former Akzo Nobel site is now controlled by Vistry Partnerships and was recently granted planning permission for the

development of up to 127 dwellings. To the east is Hollingworth Road / B6225, with agricultural land beyond. To the south is Lake Bank (road), which borders Hollingworth Lake and a number of residential dwellings. The south-eastern part of the Hollingworth Road land parcel comprises a public car park for visitors to Hollingworth Lake. To the west are residential dwellings associated with the settlement of Smithy Bridge.

- 3.5.3 The Hollingworth Road land parcel predominantly comprises 8 agricultural fields that are currently used for grazing of horses and cattle. The field boundaries are defined by dry stone walls, hedgerows and to the west by the rears and side boundaries of existing residential development at Smithy Bridge. Lower Cleggswood Farm is located within the centre of the Hollingworth Road land parcel and is accessed via Heald Lane, which heads south from the farm to Lake Bank.

Land Use

- 3.5.4 The Hollingworth Road land parcel comprises a series of unremarkable agricultural fields that are used for grazing, which is typical of the local and wider landscape to the east at Cleggswood Hill beyond Hollingworth Road. Residential development at Smithy Bridge lies to the west on falling landform, with the wider settlement of Littleborough extending north east to south west along the A58. Within the local and wider landscape to the east there are scattered farmsteads accessed via a series of lanes.

Landform

- 3.5.5 The Hollingworth Road land parcel is variable in topography, with land falling away from a central ridge through the land parcel to the east and dropping steeply towards the Rochdale Canal to the north and rising to the west to a plateau. This variable topography is characteristic of the surrounding landscape.
- 3.5.6 There is a notable change in topography within the Hollingworth Road land parcel; the eastern part of the land parcel gently falls north to south from 170m AOD to 165m with the western part of the land parcel forming the highest point of Brown Brow Hill at 181m AOD.

Vegetation

- 3.5.7 The Hollingworth Road land parcel contains a notable group of trees around the existing car park within the south-eastern corner of the land parcel, which provides a mature feature within the land parcel and a verdant street scene to Hollingworth Road and Lake Bank.

Cultural / Recreational Associations

- 3.5.8 There are no designations for landscape quality of value within the Hollingworth Road land parcel or in its immediate vicinity. There are several within the local area to the north and west, these include 'Rochdale Canal Lodge Bridge' Grade II listed, approximately 165m to the south west of the land parcel at the closest point, and 'Stubley Old Hall', approximately 505m to the north of the land parcel. There is, however, a degree of separation between these features and the land parcel as a result of intervening landform, mature vegetation and built form. A number of PRow within the land parcel provide a good level of connectivity with the immediate, local and wider settlement and countryside. Within the local area to the south east, there is an extensive PRow network, which includes a series of long distance routes.

Scenic Beauty

- 3.5.9 The location of the Hollingworth Road land parcel on the top and sides of the Brown Brow Hill results in views out towards the north and east in particular, from the high ground within the western part of the land parcel. The land drops away to the Rochdale Canal to the north and Hollingworth Road to the east, before rising up to the wider Pennine Hills. To the west, the land falls away before rising up to Owl Hill to the south west. Views from the east, south and

west generally perceive the land parcel as set against the built edge of Littleborough and in particular the existing development at Smithy Bridge. The higher ground within the western part of the Hollingworth Road land parcel is more visually sensitive given its elevated nature although the landform by contrast to the local and wider topography is lower lying and as such the land parcel does not form part of the skyline in views. Overall, the scenic quality is moderate due to the open nature of the Hollingworth Road land parcel and associated agricultural use, with limited boundary features which are characteristic features of this landscape type.

Visual Influence

- 3.5.10 Views over the Hollingworth Road land parcel are possible from the existing PRoW within the land parcel and Hollingworth Road to the east. Views from the existing settlement edge that bounds the western edge of the land parcel are limited due to the orientation of built form, existing topography, and intervening vegetation. Views from the immediate south are heavily restricted by the combination of mature roadside vegetation and the notable drop in the landform, this results in there being little appreciation of the Hollingworth Road land parcel. The nature of the topography in and around the land parcel plays a key role in varying visibility into and over the land parcel alongside the existing development at Smithy Bridge and Littleborough. As the landform rises within the wider landscape, the Hollingworth Road land parcel and wider settlements becomes more evident. Where there are views from this higher ground, the land parcel is seen in the context of the existing the immediate settlement edge, and although it extends development on to the top of Brown Brow Hill, it does not form a notable high point within the local area.

Recreational

- 3.5.11 A series of PRoW cross the Hollingworth Road land parcel and connect with the local and wider PRoW network; the routes within the land parcel are:
- PRoW LitFp439 runs north from Lake Bank along Heald Lane, where south of Lower Cleggswood Farm it joins PRoW LitFp437 and PRoW LitFp438.
 - PRoW LitFp438 runs north east along the southern edge of a dry stone wall before crossing through the eastern-most field and ending at Hollingworth Road.
 - PRoW LitFp437 runs north along Heald Lane where, south of Lower Cleggswood Farm, it joins PRoW LitFp438.
 - PRoW LitFp439 runs north from Lower Cleggswood Farm, where it becomes PRoW LitFp425.
 - PRoW LitFp427 runs north west from the junction with PRoW LitFp425 at the northern site boundary, across the edge of the higher ground of Brown Brow Hill.
 - PRoW LitFp444 runs south west from Lower Cleggswood Farm to the residential edge at Smithy Bridge.
- 3.5.12 The key routes within the immediate and local area include PRoW LitFp251, which provides connectivity from the Rochdale Canal and a number of further routes that connect into Smithy Bridge to the west and Littleborough to the east.

The Surrounding Area

- 3.5.13 There are two European/Nationally designated sites within 10km of the land parcel. The Rochdale Canal Special Area of Conservation ('SAC') and Site of Special Scientific Interest ('SSSI') are situated to the immediate north of the land parcel. The South Pennine Moors

SAC/SSSI and South Pennine Moors Phase 2 Special Protection Area ('SPA') is 1.4km east of the site. There are no other statutorily designated sites within 2km of the land parcel.

- 3.5.14 While the Rochdale Canal borders the north of the land parcel and Hollingworth Lake is directly south, the land parcel is within Flood Zone 1 and at very low risk of flooding from rivers or the sea. The land parcel is also predominantly at very low risk of surface water flooding. There is a flow path running along the eastern boundary of the land parcel linking an outfall from Hollingworth Lake to the pond on the north eastern boundary and then through the former Akzo Nobel site linking to the Rochdale Canal. The eastern part of the land parcel is at potential risk from reservoir flooding, which would be in an extreme case should a failure of Hollingworth Lake reservoir occur.
- 3.5.15 There are no designated heritage assets within the land parcel boundary. The closest designated heritage assets are two Grade II* listed buildings and 16 Grade II listed buildings within 1km of the land parcel. The nearest conservation area, Hollingworth Fold, is 600m south-east of the land parcel boundary.

3.6 Landscape Character

- 3.6.1 Landscape Character Assessment is a descriptive approach that seeks to identify and define the distinct character of landscapes that make up the country. This approach recognises the intrinsic value of all landscapes, not just 'special' landscapes, as contributing factors in people's quality of life, in accordance with the European Landscape Convention. It also ensures that account is taken of the different roles and character of different areas, in accordance with the NPPF Core Principles.
- 3.6.2 This section describes the characteristics and landscape management guidelines of Landscape Character Areas ('LCAs') identified within Landscape Character Assessments at national, regional and local level that are relevant to the Site and the study area. Only those LCAs considered to have the potential to experience appreciable effects as a result of the Proposed Development are included in this assessment.
- 3.6.3 The description and key characteristics of each LCA are used as a basis for evaluation in order to inform proposed mitigation of landscape and visual effects and to make judgements on the significance of those effects. The extent of published LCAs in the vicinity of the land parcel are summarised below.

National Character Areas

- 3.6.4 As part of Natural England's responsibilities in delivering the Natural Environment White Paper, Biodiversity 2020 and the European Landscape Convention, Natural England has developed a series of National Character Area ('NCA') profiles. These NCA profiles include an outline of the key characteristics that define broad landscape character areas. The Hollingworth Road land parcel is located within NCA 36: Southern Pennines, the assessment for which sets out five Statements of Environmental Opportunity ('SEO') as well as the key characteristics of the area:

"SEO 1: Safeguard, manage and enhance the large areas of open, expansive moorland..."

SEO 2: Manage and enhance the pastoral character of the moorland fringes, lower hills and valleys, with their mosaics of pastures and meadows and their strong field patterns defined by drystone walls, to improve ecological networks and strengthen landscape character.

SEO 3: Protect the comprehensive range of historic landscape features for their cultural value and the contribution they make to local distinctiveness and sense of identity.

SEO 4: Improve opportunities for the enjoyment and understanding of the landscape and to experience a sense of escapism and inspiration, while also conserving the qualities of the landscape and its valuable historic and wildlife features.

SEO 5: Protect the strong relationship between landscape and the underlying geology, the land uses it supports and its significance to the cultural identity of the area.”

3.6.5 The key characteristics of the NCA 36 that relate to the Hollingworth Road land parcel are set out below:

- *“Large-scale, open, sweeping landscape with high flat-topped hills providing extensive views, cut into by narrow valleys with wooded sides;*
- *Mosaics of moorland vegetation on the plateaux, including blanket bog and heathland, supporting internationally important habitats and assemblages of upland birds, invertebrates and breeding waders;*
- *Enclosed upland pastures and hay meadows enclosed by drystone walls on the hillsides, and narrow valleys with dense gritstone settlements in the valleys, with steep slopes often densely wooded, providing strong contrast with open moorlands;*
- *Many reservoirs on the moors, supplying drinking water to adjacent towns, wintering and breeding habitats for birds and high quality recreation experiences;*
- *Medieval villages and smallholdings on the higher shelves of land above the valleys, with small fields and a dense network of lanes and paths; and*
- *Historic packhorse routes traversing the moorlands, with more recent road, rail and canal routes located along valleys...”*

3.6.6 The key characteristics and SEOs provide useful background to the character of the wider area and the overarching aims for management of the landscape. However, due to the extensive area of the NCA in relation to the Hollingworth Road land parcel, and the wide range of landscape characteristics found within it, it is considered highly unlikely that the Proposed Development has the potential to result in appreciable effects on the character of the LCA as a whole and is therefore scoped out of the assessment.

Regional Landscape Character

Regional Greater Manchester Landscape Character Assessment (2018)

3.6.7 The Hollingworth Road land parcel is situated within the Landscape Character Type (‘LCT’) Pennine Foothills (West/South Pennines) and the LCA 28: Rochdale and Oldham South Pennine Foothills.

3.6.8 Key characteristics of the LCA include:

“Topography, geology and drainage

- *Transitional landscape sloping up from the northern fringes of Greater Manchester towards the uplands of the South and West Pennines.*
- *Strongly rolling and undulating topography punctuated by locally distinctive hills and carved by intricate stream valleys. Elevation ranges from 100 to over 350 metres AOD at Besom Hill.*
- *Primary underlying geology of Pennine Coal Measures, with areas of Millstone Grit overlain with glacial till deposits. Soil fertility is generally poor, with much of the LCT defined as Grade 4 agricultural land, with some pockets defined as Grade 3.*

- *Streams drain through cloughs to a number of reservoirs, although these are generally smaller than those on higher ground within the Unenclosed Uplands and Fringes LCT.*

Land use and field patterns

- *Land use is dominated by lush semi-improved grassland pastures enclosed by a mix of gritstone walls, hedgerow boundaries and post and rail fencing. Horse paddocks are often found adjacent to settlement.*
- *Varied small-medium scale enclosures, divided by a mixture of field boundaries including gritstone walls, hedgerows and post and rail fencing. Field are predominantly piecemeal post-medieval enclosures, with some modern agglomeration.*
- *Various other land uses, including quarries and reservoirs and frequent recreational facilities such as golf clubs. Country Parks are located at Tandle Hill (Oldham District) and Hollingworth (Rochdale District).*

Semi-natural habitats and woodland cover

- *Numerous semi-natural habitats scattered throughout the farmland including woodland, grassland, heathland and streams/brooks, some of which are locally designated as Sites of Biological Importance.*
- *Well wooded landscape with extensive tree and woodland cover with trees in stream valleys, along field boundaries and avenues of trees along roads. Tracts of dense broadleaved woodland also define cloughs, including large areas of ancient woodland.*
- *Reservoirs including Hollingworth Lake (designated as a Site of Biological Importance) enhance the nature conservation interest and are important for wintering waterfowl.*

Archaeology and cultural heritage

- *Numerous Conservation Areas reflecting the historic character of settlements, including Ainsworth, Nangreaves, Stone Breaks, Clegg Village and Riding Gate which contain clusters of Listed Buildings.*
- *A number of historic buildings are scattered throughout the landscape including Grade II* Listed Buildings including Clegg Hall, Grotton Hall and Birchinley Manor Farmhouse.*
- *Evidence of the area's industrial heritage in the form of old mill buildings, chimneys, disused quarries and mines and the Rochdale Canal.*

Settlement, road pattern and rights of way

- *Settlement mainly comprises scattered traditional stone farmsteads and halls, with some small groups of dwellings including Victorian terraces. The largest settlement is Ainsworth, located between Bury and Bolton. The foothills provide an important separation function between distinct urban areas.*
- *Numerous footpaths and bridleways cross and provide access to the landscape from nearby urban areas and also link to the moorlands. These include the Rotary Way, Oldham Way and Rochdale Way.*

- *Road pattern mainly comprises minor winding lanes and tracks connecting farms. Occasionally, more major routes cross through the LCT, including the M62 and several A-roads.*

Views and perceptual qualities

- *Variable visual character depending on topography and vegetation cover; there are long views across the urban conurbation to the West and South Pennine uplands beyond where vegetation allows. Areas within the Peak District National Park are visible from some vantage points. Other areas are visually enclosed due to valleys or vegetation which creates wooded skylines.*
- *Occasionally, masts and pylons/overhead lines intrude on the wooded skylines. Other intrusive modern influences include the M62 motorway and prominent views of urban development, including tower blocks breaking horizons.*
- *Other skyline features including chimneys, the war memorial in Tandle Hill Country Park and views to monuments on higher ground within the uplands including Peel Tower and Bishop Park Monument.*
- *Windswept and exposed on higher ground as the landscape transitions to the upland fringe. This contrasts with the sheltered, enclosed feel of the valleys which have limited views in and out.*
- *Areas with relatively high levels of tranquillity despite the close proximity of urban development and major infrastructure e.g. Tandle Hill Country Park."*

- 3.6.9 The assessment provides a description of the LCT in terms of intactness and condition, stating:

"Despite the close proximity of urban development, this is a strongly rural and traditional working landscape characterised by pasture fields, reservoirs and wooded stream cloughs with a transitional, upland fringe feel. Trees are frequent and provide a naturalistic quality to the landscape and characterise skylines. Locally designated habitats actively managed for the benefit of wildlife are found throughout the foothills landscape. Some former industrial and agricultural buildings have been converted to new uses, often retaining traditional features.

The deterioration of stone walls is visible in many places, with supplementation by post and wire fencing frequently occurring. Adjacent to settlements, there are often urban fringe influences including areas of horiculture with associated structures and pony tape and numerous golf courses. Within the wooded stream valleys, invasive species are present including large areas of rhododendron which outcompete native vegetation. Anti-social behaviour including fly tipping and litter has an adverse effect on the landscape in some localities. Pylon lines and masts form intrusive modern features on the skyline, while noise and movement introduced by transport infrastructure can detract from the rural qualities and sense of tranquillity in the landscape."

- 3.6.10 The assessment goes on to consider the landscape sensitivity to 2-3 storey residential housing development where it concludes that the LCA has a Medium sensitivity.

- 3.6.11 A summary is provided of the special landscape qualities and key sensitivities that would be sensitive to change:

- The strongly undulating landform punctuated by distinctive hills and carved by intricate stream valleys.
- The undeveloped skylines, including both wooded and open skylines. Some hill summits are punctuated by monuments which form landmarks in the wider landscape (e.g. Tandle

Hill). The views to landmarks in adjacent landscapes (e.g. Peel Tower on the adjacent uplands) are also distinct.

- The distinct field pattern of enclosures demarked by a mixture of gritstone walls and hedgerows.
- The sparsely settled traditional rural character of the landscape, with scattered farms and houses and occasional settlements constructed of a local stone vernacular, a number of which are designated as Conservation Areas.
- Pockets of upland habitats amongst the pasture fields. Locally designated habitats including broadleaved woodland, wet grassland and wetlands (including Hollingworth Lake SBI).
- Areas of woodland including tracts of ancient woodland along stream corridors. Creating wooded skylines and a sense of visual enclosure.
- The undeveloped backdrop and the sense of separation that the landscape provides between distinct settlements.
- Views to and from the Peak District National Park and the surrounding South and West Pennines which overlook the landscape.
- Important recreational value of the landscape with important networks of public rights of way including Rotary Way, Oldham Way and Rochdale Way and destinations including Tandle Country Park and Hollingworth Country Park.
- Features relating to the industrial heritage of the area including chimneys and mill buildings. Chimneys form distinct skyline features.
- Long views afforded from higher ground which reach across Greater Manchester and to the surrounding uplands.
- Pockets of tranquillity and remoteness despite the close proximity of urban development.

3.6.12 The assessment sets out guidance and opportunities to consider within this Landscape Character Type include:

- Avoid areas of the landscape with distinct or complex landforms, including the locally prominent hills and intricate stream valleys, including Besom Hill, Tandle Hill, the ridgeline south of Bentgate, Strine Dale and Wood Brook.
- Ensure that the sense of separation the landscape provides between distinct settlements is retained.
- Retain the role of the landscape as an undeveloped backdrop to existing development.
- Strengthen the stone wall and hedgerow network, using local gritstone for walls and locally prevalent and climate resilient species for hedges. Any new boundaries should reflect local characteristics, including the planting of a new generation of hedgerow trees.
- Utilise areas of undulating landform and woodland cover to integrate new development into the landscape, avoiding sites designated for their nature conservation importance.
- Protect areas of semi-natural habitat including woodland, grassland and heathland which are locally designated as Sites of Biological Importance. Seek to enhance these where possible and provide linkages to form robust habitat networks.

- Protect areas of broadleaved woodland (particularly ancient woodland) which provide important seminatural habitat and create wooded skylines. Utilise the screening effects of existing woodland to integrate development into the landscape where possible.
- Encourage the natural regeneration of woodland and wetland habitats within valleys (as well as new planting/habitat restoration) to improve their function in flood prevention and preventing diffuse pollution.
- Ensure that any development is in keeping with the form, density and vernacular of existing buildings. Avoid any large scale development to retain the sparsely settled character of the landscape.
- Protect the setting of important heritage assets within the landscape, including Conservation Areas/Listed Buildings.
- Retain the important recreational function of the landscape. Seek to improve public rights to way to encourage sustainable travel. Join up and promote multi-use routes to major destinations within the landscape including Hollingworth Country Park and Tandle Hill Country Park.
- Retain the distinct visual character of the landscape, including views to monuments on skylines which form local landmarks (including Tandle Hill War Memorial and Peel Tower), church spires and chimneys.
- Ensure any new development does not adversely affect the special qualities of the Peak District National Park, including its beautiful views, sense of tranquillity and dark night skies, and the vital benefits that flow beyond its boundary.
- Design-in the introduction of SuDS to any new development, addressing any changes in hydrology (and subsequent knock-on effects such as increased diffuse pollution from agricultural run-off).

3.6.13 Key characteristics of LCT 29 – Open Moorlands and Enclosed Upland Fringes (West/South Pennines): Rough Hill to Brun Moor – include:

“Topography, geology and drainage

- *An elevated, upland landscape rising up to the higher Pennine moorlands/plateaux in the north and east of Greater Manchester. The landform was formed by glacial action and is widely varied and locally distinct, with broad sweeping uplands, areas with dramatic folds, terraces and slopes and occasional stream valleys.*
- *Underlying bedrock geology of Pennine Coal Measures (mudstones, siltstones, sandstones) and Millstone Grit. The uplands are characterised by expansive peat deposits.*
- *Generally, soil fertility is poor; the majority of agricultural land is classed as Grade 4 or 5.*
- *Small streams and brooks drain the uplands into numerous reservoirs. Some also drain into major rivers including the River Tame and River Irwell.*

Land use and field patterns

- *Higher elevations characterised by unenclosed open moorland used for rough grazing (predominantly by sheep). Large-scale wind farms occupy some of the higher moorland areas, notably Knowl Moor (Scout Moor Wind Farm) and Shore Moor. A military Danger Zone is located on the edge of Holcombe Moor.*

- *Upland fringes comprise semi-improved grassland pasture enclosed by a network of gritstone walls (with some replacement by post and wire fencing). Enclosures form a patchwork of small irregular and larger rectangular fields, including Parliamentary enclosures.*
- *Land use in the upland fringes is primarily sheep and cattle farming, with some remnants of unimproved upland pastures. Localised areas are used for horse and pony paddocks.*
- *Past and present quarrying activity has left frequent imprints on the landscape. A number of these sites have been restored as semi-natural habitat and some serve as destinations for recreational activity e.g. Crompton Moor. Golf courses form occasional features close to the urban edge.*
- *Reservoirs also form valued recreational destinations with visitor facilities, including Watergrove Reservoir and Ogden Reservoir. Smithills Country Park covers a large area around Smithills Moor.*

Semi-natural habitats and woodland cover

- *Rich mosaic of upland habitats including heather moorland, blanket bog, acid grassland and wet and dry heathland. Extensive areas are internationally or nationally designated for their nature conservation value, including the South Pennine Moors SPA/SAC/SSSI/SBI and West Pennine Moors SSSI.*
- *Within the enclosed upland fringes, disused quarries, reservoirs, broadleaved valley woodlands, species rich grassland and wetlands are often locally designated as Sites of Biological Importance (SBIs).*
- *On the whole, woodland is sparse on the unenclosed uplands. Coniferous/mixed plantations are associated with reservoirs and quarries. Tracts of broadleaved woodland clothe the sides of valleys. Trees also feature along field boundaries within the enclosed upland fringe.*

Archaeology and cultural heritage

- *Important archaeological landscape containing Scheduled remains including a Blackstone Edge Roman Road, a Roman Fort (near Castle Shaw) and Scheduled Bowl Barrow (near Knarr Barn). The peat deposits on the uplands are also likely to contain a rich record of preserved prehistoric archaeology.*
- *Evidence of the industrial heritage of the area, with numerous disused quarries and mines. Near to settlements, mills and chimneys form frequent landmarks.*
- *The enclosed landscape contains a number of historic settlements, many of which are designated as Conservation Areas with clusters of Listed Buildings, including prominent churches.*
- *Inspirational landscape, with well-known cultural associations. The open moorland provided inspiration for Ted Hughes (from neighbouring Calderdale) and poet Ammon Wrigley. Monuments including Peel Tower (Grade II listed) are located in elevated locations.*

Settlement, road pattern and rights of way

- *Remote with a lack of development within the open moors. The upland fringes have a sparsely settled character, with traditional millstone grit stone-built farms,*

dispersed cottages and houses and several historic villages with a unifying stone vernacular.

- *Occasional halls, manors and country residences are also scattered throughout the landscape, including Smithills Hall (Grade I Listed) in Bolton District and Shore Hall (Grade II* Listed) in Rochdale District.*
- *Relatively sparse road network, with farms and settlements linked by minor roads and tracks. Some larger routes cross the landscape, including the M62 and numerous A-roads.*
- *Forms an attractive, undeveloped remote backdrop to and has a strong visual relationship with nearby urban areas.*
- *The unenclosed moorlands include large areas of Open Access Land. Long distance routes pass through the LCT, including the Pennine Way National Trail, Rochdale Way and Rotary Way, which link to a strong rights of way network. Many routes crossing the moorland are based on historic packhorse routes.*

Views and perceptual qualities

- *Long, panoramic views are afforded by the high elevation of the landscape. There is often intervisibility with the dramatic Dark Peak moorlands of the Peak District National Park, particularly in the eastern parts of the LCT.*
- *The landscape evokes a strongly rural, remote and continuation of character of the Pennine uplands with gritstone walls, traditional farms, sheep grazed pastures and rough moorland.*
- *The unenclosed moorland is characterised by muted colours with subtle colour changes. The landscape is strongly influenced by the changeable weather conditions.*
- *This landscape is often associated with a sense of openness, remoteness and isolation. This perception can be broken in places by views of urban development and the presence of intrusive modern features including the M62 motorway.*
- *Wind turbines and pylons/overhead lines punctuate the mostly open and undeveloped skylines. Masts are a feature of higher ground and are occasionally found in clusters.*
- *Within the stream valleys, there is a contrasting sense of enclosure due to topography and woodland cover.”*

3.6.14 The assessment further notes intactness and condition:

“The uplands and upland fringes are a remote, highly rural landscape. Generally the landscape is intact with an important mosaic of textured semi-natural upland habitats on the unenclosed moorland and grassland traditionally managed by sheep grazing in the enclosed fields. It forms a continuation of character from the wider Pennine upland landscapes, including the Dark Peak area of the Peak District National Park.

Issues which impact on intactness and condition include stone-wall boundary loss and subsequent replacement by post and wire fencing and urban fringe influences adjacent to development, including the proliferation of horse keeping in some localised areas (with associated structures and features including pony tape). Large-scale wind turbines and pylon lines form dominant features on the otherwise undeveloped skylines. Active quarrying operations introduce noise and movement, which detract from the remote and tranquil qualities of the landscape. Litter (particularly along roads and in car parks) and fly

tipping are also issues within this landscape. Some areas are frequently used for illegal off-roading (predominantly with dirt bikes and quads) resulting in damage to important habitats. Wildfires also impact upon the intactness and condition of semi-natural habitats. Designated habitats on the unenclosed moorland of the South Pennines are mostly in 'unfavourable recovering' condition. Areas within the West Pennine Moors SSSI vary in their condition from 'unfavourable – no change' to 'favourable'. Restorative works and active management are regularly undertaken on large areas of the moorland to improve habitat condition."

- 3.6.15 The Greater Manchester Landscape Character and Sensitivity Study ('GMLCSS', 2018) provides an overall assessment of landscape sensitivity for the LCT; the sensitivity relating to 2-3 storey residential developments is considered Medium-High. the assessment states that:

"The open unenclosed moorland areas would be of high sensitivity to any type or scale of development. Within LCA 30: Shore Edge to Dove Stones Reservoir, Harrop Edge and locations which are directly adjacent to the Peak District National Park are judged as of high sensitivity to both development scenarios considered as part of this assessment. This is due to the highly prominent, widely visible character of these areas. Their location close to the Peak District National Park means that development could have an adverse effect on the special qualities of the protected landscape. It is therefore of paramount importance that the guidance below is closely followed when development proposals are considered in these parts of the landscape."

- 3.6.16 In relation to the characteristics set out in this assessment, the Hollingworth Road land parcel lies on a lower foothill – Brown Brow Hill, which reaches to 118M AOD; the landform for the most part falls north east / east towards Hollingworth Road, with an area of notably steep land defining the north western extent. The agricultural fields within the Hollingworth Road land parcel are defined by remnant stone walls that are in a state of disrepair with the internal vegetation, for the most part, limited to the Hollingworth Road land parcel boundaries which includes a notable group of trees around the existing car park area within the south eastern corner of the land parcel, and these provide a mature feature within the site and verdant streetscene to Hollingworth Road and Lake Bank.

District Landscape Character

- 3.6.17 The GMLCSS (2018) shows that there is no existing landscape character area coverage for the local area within which the Hollingworth Road land parcel falls.

Site Appraisal

- 3.6.18 A landscape appraisal has been undertaken to ascertain the existing character of the Hollingworth Road land parcel. This is achieved through recording and analysing the existing landscape features and characteristics, the way the landscape is experienced, and the value or importance of the landscape and visual resources in the vicinity of the Hollingworth Road land parcel. The elements of the landscape that contribute to landscape character include the built and natural form, the pattern of features, detailing, scale, planting, land use and human perception. In this regard, landscape character is derived as a result of the perception of, and action and interaction of, natural and human factors.
- 3.6.19 The character and physical features of the Hollingworth Road land parcel are described below with reference to **Site Appraisal Photographs ('SAPs') A-F**, included within **Appendix B.4 and Appendix B.6**. The locations of photographic viewpoints are illustrated on **Appendix B.1**, Figure 3.4: Site Appraisal Plan.
- 3.6.20 The Hollingworth Road land parcel comprises agricultural land situated on and around Brown Brow Hill, which is a small foothill of the Pennines and forms the transition in landform between the lower lying River Roch valley to the north and the rising landform of the Pennines to the east. There is a notable change in topography within the land parcel, visible in SAP A; the eastern part of the land parcel gently falls north to south from 170m AOD to 165m with the

western part of the land parcel forming the highest point of Brown Brow Hill at 181m AOD visible in SAP B.

- 3.6.21 There is a degree of existing development within the land parcel; a small farm complex consisting of a farmhouse and outbuildings is located centrally along Heald lane, which runs on a north / south axis through the land parcel. Further development, a single detached residential property and associated garage block, is located within the south western corner of the land parcel. In addition, the south eastern corner of the land parcel is currently defined by a car park set within a wooded setting on lower lying landform to the south around Hollingworth Lake, visible in SAP E.

The Site and the Immediate Setting

- 3.6.22 There are no landscape designations present within the Hollingworth Road land parcel.
- 3.6.23 Natural and Cultural Heritage – the land parcel is located on and around Brown Brow Hill, which reflects the surrounding landform of small foothills to the Pennines that rise further to the east and north. It is considered that the land parcel has low natural or cultural heritage.
- 3.6.24 Landscape condition – the land parcel is for the majority pastoral fields bound by stone walls, although, where these have been lost, either post and wire or electric fencing on plastic stakes, typically found to demark paddocks, has been used. Overall, the condition is one of a degraded landscape with the historic characteristic features slowly being lost and the land parcel being in poor condition.
- 3.6.25 Associations – there are no known associations with the land parcel either through literature, poetry or other media. The land parcel is also not linked or connected with notable historic events or famous people.
- 3.6.26 Distinctiveness – the landscape character is in decline with typical landscape features being degraded or lost. The existing features within land parcel are not considered rare and reflect the surrounding land use.
- 3.6.27 Recreational – a number of footpaths cross the land parcel, providing a level of connectivity with the local and wider PRow network.
- 3.6.28 Perceptual (scenic) – there is a degree of scenic quality through the existing fieldscape, although this is eroded due to poor management where the historic stone walls have been lost and replaced by electric fencing.
- 3.6.29 Perceptual (wildness and Tranquillity) – is somewhat eroded by the neighbouring uses, with residential development to the west and the land parcel bound by transport infrastructure to the north – canal and trainline, the east – Hollingworth Road and the South – Lake Bank. However, the very limited development within the land parcel and the nature of the landform provides a sense remoteness.
- 3.6.30 Functional – the land parcel forms the eastern side of Brown Brow Hill, a small foothill as part of the wider higher landform which extends to the Pennines, currently developed across its western side with residential uses. The Former Akzo Nobel site benefits from a recent approval for residential development, which will change the local character and function – the effects are assessed within the cumulative effects section.
- 3.6.31 Overall, the character of the land parcel is eroded by poor management and adjacent built form and road infrastructure provide an urbanising influence on the land parcel. The land parcel has land uses typically associated with those found at the settlement edge. On balance it is considered that the Hollingworth Road land parcel and the immediate setting has a Medium value.

Landscape Receptors

- 3.6.32 On the basis of the Site Context analysis and the Site Appraisal, the following landscape features and character areas (as set out in Table 3.1) have been identified as receptors for the assessment of effects arising from the development. The value, susceptibility and resultant sensitivity of these landscape receptors are set out with full narrative in Appendix B.3: Landscape Effects Table.

Table 3.1 Landscape Receptors

Receptor	Value	Susceptibility	Sensitivity
Fields	Medium	High	High
Stone Walls	Medium	Medium	Medium
Hedgerows	Low	Medium	Medium
Trees	Medium	Medium	Medium
Field Ponds	Low	Low	Low
National Character Area (NCA) 36	Medium	Low	Medium
LCT: Pennine Foothills (West/South Pennines) LCA 28 - Rochdale and Oldham South Pennine Foothills	Medium	Medium	Medium
LCT Open Moorlands and Enclosed Upland Fringes (West/South Pennines) - LCA 29 – Rough Hill to Brun Moor	Medium	Medium	Medium
The Site and its Immediate Context	Medium	Low	Medium

Visual Appraisal

- 3.6.33 A visual appraisal was undertaken to determine the relationship of the land parcel with its surroundings and the approximate extent of its visibility within the wider landscape as experienced from publicly accessible viewpoints (roads, footways, public rights of way and open spaces). The visibility of the land parcel is predominantly influenced by landform and the extent and type of vegetation cover and built elements within the surrounding landscape. Baseline studies of these features enabled the identification of the potential visibility of the land parcel from the surrounding area to be tested through fieldwork.
- 3.6.34 A Zone of Theoretical Visibility (ZTV) and location of Site Context Photographs ('SCP') is presented within **Appendix B.1, Figure 3.5: Visual Appraisal Plan**. The SCP images are presented within **Appendix B.5 and B.7 Site Context Photographs**, with a description of the baseline visual characteristics of the land parcel and its context set out within this section.

Close Range Views

- 3.6.35 A number of PRoW cross the land parcel, which allow for views over the land parcel and out to the local and wider landscape. These views take in the settlement edge, fringe landscape and the higher ground of the Pennines in the wider landscape to the east and north, as demonstrated by **SCPs 1-7**. **SCP 1** is taken from PRoW LitFp251 which runs along the edge of the area of protected green space, with the landform falling steeply to the Rochdale Canal. Views from here take in the existing development of Littleborough, with the higher ground visible beyond, upon which are a series of wind turbines. PRoW LitFp251 joins PRoW LitFp427 (**SCP 2**) where there are greater views along the valley within which the majority of Littleborough Settlement built form is located with wider views towards the Pennines to the north possible.
- 3.6.36 An existing track runs roughly through the middle of the land parcel, along which runs PRoW LitFp436 (**SCP 3**), with views possible over the lower lying eastern part of the land parcel, and the Former Akzo Nobel site to the north east of the land parcel – which benefits from planning permission for 127 residential properties – visible in the foreground. Once built out, the residential development will replace views of the existing brownfield site, which has been

reclaimed by vegetation. The approved development will also partially screen views out to the north.

- 3.6.37 **SCP 4** is taken from PRoW LitFp444, which runs east from the edge of Smithy Bridge estate over the higher ground within the western part of the land parcel; from here there are very limited views over the eastern part of the land parcel. Hollingworth Road is visible in the middle distance with the higher ground of Cleggswood Hill, beyond which the higher ground at the Pennines is visible, providing a notable backdrop to the view.
- 3.6.38 **SCP 5**, is taken along Heald Lane, which provides access to Lower Cleggswood Farm, visible in the left of the view. PRoW LitFp437 also follows the lane, and after the farm it becomes LitFp446. Views from this location are limited by the surrounding higher ground with existing development along Hollingworth Road visible to the centre left of the view. The Former Akzo Nobel site to the centre right of the view, once built out, will introduce built form within the view.
- 3.6.39 **SCP 6 and SCP 7** is taken from Hollingworth Road / PRoW LitFp438 with views over the lower eastern part of the land parcel, and Lower Cleggswood Farm visible in the centre of the view. The existing residential development at Smithy Bridge is visible in the skyline.
- 3.6.40 Rochdale Canal / PRoW LitFp250 (**SCP 8**) run along the northern boundary; the nature of the local landform results in views from this lower lying position being heavily restricted, although the nature of the views will change as a result of the adjacent Former Akzo Nobel site, which is partially visible in the left of the view.
- 3.6.41 **SCP 9** is taken from PRoW LitFp247, approximately 128m to the north west of the Hollingworth Road land parcel, the view looking over the agricultural fields that define the immediate setting. The canal embankment runs across the view beyond the fields with woodland associated with the Former Akzo Nobel site to the left of the view and steep slope within the north western part of the land parcel to the right of the view. There are glimpsed views of the existing residential development at Smithy Bridge on the higher ground further to the right of the view.
- 3.6.42 **SCP 10 and SCP 11** demonstrate the nature of views from Lake Bank, which defines the northern edge of Hollingworth Lake. The elevated position and the intervening vegetation to the immediate north limit views towards and over the land parcel. There is a glimpsed view possible between the break in the hedgerow and the woodland into the land parcel within the centre of **SCP 11**.

Mid Range Views

- 3.6.43 **SCP 12** is taken from the A58 / New Road looking towards the northern land parcel boundary, the higher ground within the western part of the land parcel. The foreground is defined by existing development to the south of the A58, where development fronting the road is stone faced with the development further back being red brick. The existing development at Smithy Bridge is partially visible in the centre of the view set within a vegetated setting.
- 3.6.44 **SCP 13 and SCP 14** demonstrate the nature of views from around Hollingworth Lake / Rakewood Road, the distance from the land parcel alongside the intervening landform, built form at Smithy Bridge and mature vegetation within the land parcel result in views being heavily screened.

Long Distance Views

- 3.6.45 **SCP 15** demonstrates the nature of views from the south-east as the landform rises. There are views over the lower lying landform of a shallow localised valley with the earthworks associated with Hollingworth Dam visible in the centre of the view. Existing development at Smithy Bridge is visible along Lake Road with partial views of the mature vegetation within the

southern part of the Site and the higher ground within the western part. In the long distance there are views of Littleborough with the rising landform.

- 3.6.46 **SCP 16-19** demonstrate the nature of views from the higher ground within the wider landscape to the east. Views from the higher ground are expansive and long ranging. Hollingworth Lake is visible in the middle distance with the sprawling development of Littleborough and the northern edge of Rochdale. The land parcel is seen in the context of the existing development of Smithy Bridge and along Lake Bank.
- 3.6.47 **SCP 20** demonstrates the nature of views of the land parcel from the south-east, which features falling landform to the Hollingworth Lake as with the wider views to the east the higher ground within the western part of the land parcel is seen in the context of the existing development as Smithy Bridge and along Lake Bank in the middle distance. Overall, the land parcel is glimpsed in an extensive panoramic view set against a backdrop of hills.
- 3.6.48 **SCP 21 and SCP 22** demonstrates the nature of views from the higher ground that forms the northern edge of the upper Roch Valley. From these locations there are views towards the land parcel over the existing settlement of Littleborough, and the majority of the land parcel is visible and viewed in the context of the existing development at Smithy Bridge. Hollingworth Lake is visible beyond the land parcel on higher ground with the wide panoramic views taking in the wider hills, large commercial / logistics buildings within Rochdale to the right of the view. Overall the land parcel is glimpsed in an extensive panoramic view set against a backdrop of hills.

Visual Receptors

- 3.6.49 In summary, the character of the local area is settlement edge with the land parcel being of agricultural character, mainly used for grazing, across the land parcel with low lying hedgerows with hedgerow trees or stone walls defining the fieldscape, which are typical of the landscape character. The elevation, particularly the western part of the land parcel, the lack of structural vegetation across the land parcel and surrounding higher ground result in there being views towards and over the land parcel from the immediate setting, local and wider landscape. The existing Smithy Bridge residential development and the wider settlement of Littleborough are particular visible in close, mid and long distance views to the north-east and north-west.
- 3.6.50 The main visual receptors are users of the PRow network within the land parcel and the immediate setting, with an increase in visibility from the surrounding higher ground within the wider landscape to the north and east. The land parcel is viewed in the context of the existing settlement edge of Smithy Bridge and Littleborough, with a number of notable farmsteads in the immediate context of the land parcel and the large Hollingworth Lake to the immediate south east.
- 3.6.51 On the basis of the visual appraisal, a series of visual receptors have been selected against which the effects of the development on visual amenity have been assessed. This is not intended to be an exhaustive list, as any visual receptors considered not to have the potential to experience significant visual effects have been scoped out. The value, susceptibility and resultant sensitivity of the visual receptors is set out with full narrative in Appendix B.8: Visual Effects Table, with a summary set out in Table 3.2 below.

Table 3.2 Visual Receptors

Receptor	Value	Susceptibility	Sensitivity
People using PRow within the land parcel PRow LitFp251, LitFp427, LitFp436, LitFp444, and LitFp437.	Low	High	Medium
Residential properties in proximity to the land parcel: Smithy Bridge.	Low	High	Medium
People travelling along roads adjacent to the land parcel: Hollingworth Road	Low	Medium	Medium
People travelling along PRow in the local area to the north-west: LitFp250, LitFp247 and Rochdale Canal	Low	High	Medium
People travelling along roads adjacent to the land parcel: Lake Bank and Rakewood Road	Low	Medium	Medium
Residential properties in proximity to the land parcel: Littleborough	Low	High	Medium
People using Hollingworth Lake - travelling along Rakewood Road / PRow LitFp447.	Medium	High	Medium
People travelling along PRow in the local area to the south east: LitFp473	Medium	High	Medium
People travelling along PRow in the wider area to the east: LitF525, LitFp527, LitFp524, and LitFp539	Low	High	Medium
People travelling along PRow in the wider area to the south: MilFp190	Low	High	Medium
People travelling along PRow in the wider area to the north west: LitBp101 and LitFp174	Low	High	Medium

3.7 Design / Strategy

3.7.1 The design of the development has evolved as part of an iterative process and has been informed by the findings of landscape and visual amenity conditions. Consideration of the above baseline conditions has informed the proposed layout within the land parcel, including the scale and massing of introduced built elements, and appropriate ground levels.

3.7.2 Further consideration has been given to different landscape treatments in order to deliver the objectives of the landscape strategy:

- Retention and enhancement of existing vegetation within the land parcel, where practicable;
- Conservation of hedgerows and creating new sections where these are lost to development, gapped or in poor condition;
- Providing a soft green north western and southern boundary to mitigate visual effects and retain the character of the local area;
- Providing vegetated edges (landscape buffer) along the eastern boundary to retain and enhance the land parcel boundary and streetscene, extend hedgerow and hedgerow tree planting within the central green corridor to soften views of the built form and increase the presence of this key landscape characteristic;
- Consideration to be given to Green Streets to ensure they have provision to allow street trees to grow to full size and accommodate other features such as green verges and swales;
- Retaining and increasing public access through retention of the existing PRow network that is enhanced with further footpaths and cycleways;

- Improving biodiversity across the land parcel by introducing a variety of ecological habitats to include species-rich hedgerows; native tree planting; grassland meadows; ponds and wetland habitats; street trees; native garden planting; and garden trees;
 - Creating opportunities for native tree planting throughout the Proposed Development to increase canopy cover and complement existing landscape features and habitats; and
 - Providing opportunities for maintain the views towards with wider hills / landscape from the higher ground within the western portion of the land parcel.
- 3.7.3 Key mitigation measures that have been embedded within the design of the Proposed Development as part of an iterative process and are included within the following plans:
- NW111-LS-001 (Landscape Concept) 05.24;
 - NW111-LS-002a to 008 (Site Landscaping); and
 - NW111-LS-010 and 011 (Site Landscaping+Cross Sections)
- 3.7.4 Any planting proposals and their ongoing maintenance, management and future growth, is considered as further mitigation measures and form the basis of the assessment of residual landscape and visual effects of the Proposed Development during the Operational Phase at Year 15.

3.8 Assessment of Likely Effects

- 3.8.1 In this section an assessment of the likely landscape and visual effects of the Proposed Development has been undertaken during the construction phase, at Year 1 of operation (based on the Parameter Plans and associated Parameter Descriptions) and at Year 15 (based on the objectives driving the Illustrative Landscape Masterplan (please refer to point 8.1.86 under Design/Strategy for further detail).
- 3.8.2 Significant effects only are reported in this section, while Appendix B.3 Landscape Effects and Appendix B.8. Visual Effects outline other non-significant effects.

Construction Phase

- 3.8.3 The principal activities that will have an effect upon landscape character, landscape features and visual amenity during the construction phase include:
- The loss of openness and alterations to the existing appearance of the land parcel;
 - The introduction of new temporary elements, including material stockpiles, welfare facilities, plant and machinery and construction site lighting;
 - Groundworks, topsoil stripping and excavation for ancillary structures and cables.
 - The noise and movement of plant and machinery within the land parcel and the surrounding landscape, including crane activities and construction traffic on local roads;
 - Removal of limited sections of hedgerow and trees; and
 - The building and emergence of new built forms, including residential dwellings, schools and shops.
- 3.8.4 The construction of the Proposed Development is anticipated to commence in 2025, subject to gaining planning permission, and span approximately 6 years. Overall, construction is expected to be completed by 2031.

Landscape Effects

- 3.8.5 Full explanatory commentary on the magnitude and significance of effects for the receptors is set out in Appendix B.3: Landscape Effects Table. A summary of the effects identified is set out below. Three landscape receptors are likely to experience effects that are considered significant.
- 3.8.6 Fields will be subject to the introduction of new built elements that consist of a compound, hardstanding, and plant / equipment. As a result, the pastoral character of the open fields will be affected by construction activities. There will be a variation in intensity of activity as construction progresses across the land parcel thus resulting in a gradual change of the landscape feature. **A Moderate - Major Adverse** effect will occur as a result of the noticeable change and loss of its openness and agricultural character.
- 3.8.7 Stone walls that currently in part define the fieldscape will be lost as part of the Proposed Development and are not replaced as part of the proposals, therefore resulting in a **Major Adverse effect** due to the total loss of this feature.
- 3.8.8 The Site and its immediate context will be subject to the introduction of plant and machinery, construction traffic and construction activities that will cause direct changes to the land parcel that is currently an undulating agricultural landscape with limited built form. The construction activities will introduce movement and noise to the land parcel where there will be no access for the duration of the construction stage. As a result, there will be a **Moderate – Major Adverse** effect.
- 3.8.9 The remainder of landscape receptors will be subject to adverse effects that are of minor or negligible significance, or neutral, including:
- Hedgerows will be subject to a **Neutral** effect, as the development will not affect any hedgerow, which will all be retained and protected.
 - Trees will be subject to a **Negligible Adverse** effect as the trees are located along the land parcel boundary or within proposed public open space and will be retained and protected during the construction period.
 - Field Ponds will be subject to a **Neutral** effect as all existing waterbodies will be retained.
 - NCA36 is much larger than the Hollingworth Road land parcel, and the Proposed Development will therefore occupy a very small part of NCA36 – **Negligible Adverse** effect.
 - The Proposed Development will occupy a limited part to the north of the RLCT/LCA28 – **Negligible adverse** effect.
 - The Proposed Development will have an indirect effect on a very limited part of the much larger RLCT/LCA29 – **Negligible adverse** effect.

Visual Effects

- 3.8.10 Full explanatory commentary on the magnitude and significance of effects for the identified receptors is set out in Appendix B.8 Visual Effects Table. A summary of the effects identified is set out below, with four visual receptors identified that are likely to experience effects that are considered significant (**Moderate or Major Adverse**) during the construction phase.
- 3.8.11 A series of PRow pass within the Hollingworth Road land parcel - LitFp251, LitFp427, LitFp436, LitFp444, and LitFp437. As a result, users of these public footpaths will experience immediate views of the construction activity within the land parcel, such as plant and vehicle

movements, which will cause a pronounced change across within the land parcel. As a result, there will be a **Major Adverse** significance of effect.

- 3.8.12 Residential properties in proximity to the land parcel: Smithy Bridge will have direct views of construction activities within the land parcel, with plant and vehicle movements across the view which will cause a pronounced change across within the land parcel. As a result, there will be a **Moderate Adverse** significance of effect on views of the construction activities and emerging Development within the immediate setting.
- 3.8.13 People travelling along Hollingworth Road will have direct partial / oblique views of construction activities within the land parcel, with plant and vehicle movements across the view which will cause a pronounced change across within the land parcel. As a result, there will be a **Major Adverse** significance of effect on views of the construction activities and emerging development as the road passes adjacent to the land parcel.
- 3.8.14 Residential properties within Littleborough in the local area to the north have views into and over the land parcel. Construction activities within the land parcel are from mid-range, with views limited to the proposed built form located on the higher ground of Brown Brow Hill within the western part. Development will gradually progress across the land parcel, which will contrast with the adjacent land uses and seen on the skyline. As a result, there will be a **Moderate Adverse** significance of effect.
- 3.8.15 The remainder of visual receptors will be subject to adverse effects that are not considered to be significant, including:
- People travelling along PRoW in the local area to the north-west: LitFp250, LitFp247 and Rochdale Canal - construction activities within the Site will be partially visible on the higher ground within the centre of the view, with glimpses of plant and vehicle movements across the view which will cause a limited change within the view. This will result in a **Minor Adverse** effect.
 - People travelling along Lake Bank to the south of the Hollingworth Road land parcel – there are limited / heavily screened oblique views of construction activities within the land parcel from Lake Bank due to the intervening vegetation associated with existing car park to the south eastern corner of the land parcel. This will result in a **Negligible Adverse** effect.
 - People using Hollingworth Lake, travelling along Rakewood Road / PRoW LitFp447 – views of construction activities within the land parcel from Hollingworth Lake will be heavily screened oblique views, at most, due to the intervening built form along Lake Bank and within the wider smithy Bridge area and mature vegetation associated with existing car park to the south eastern corner of the land parcel. This will result in a **Negligible Adverse** effect.
 - People travelling along PRoW in the local area to the south east: LitFp473 – construction activities within the land parcel will be partially visible on the higher ground within the centre of the view, with glimpses of plant and vehicle movements across the view which will cause a limited change within the view. This will result in a **Minor Adverse** effect.
 - People travelling along PRoW in the wider area to the east: LitF525, LitFp527, LitFp524, and LitFp539 – given the distance from the land parcel and notwithstanding views over the land parcel, it is seen in the context of the surrounding development of Smithy Bridge, Littleborough and the wider area of Rochdale, which are located on the lower lying landform. This will result in a **Negligible Adverse** effect.
 - People travelling along PRoW in the wider area to the south: MilFp190 – given the distance from the land parcel and notwithstanding views over the land parcel, it is seen in the context of the surrounding development if Smithy Bridge and Littleborough beyond and on lower lying landform. This will result in a **Negligible Adverse** effect.

- People travelling along PRow in the wider area to the north west: LitBp101 and LitFp174 – given the distance from the land parcel and notwithstanding views over the land parcel, it is seen in the context of the surrounding development of Smithy Bridge, with Littleborough in the foreground and the wider area of Rochdale beyond to the west. This will result in a **Negligible Adverse** effect.

Operational Phase (Year 1)

Landscape Effects

- 3.8.16 At Year 1 of the Proposed Development, three landscape receptors are likely to experience effects that are considered significant.
- 3.8.17 The fields' pastoral character and open nature will be lost as a result of the new built form as the settlement extends across the landform. The area of open grassland on the steep slope to the north west of the land parcel will be retained along with that through the slope passing through the centre of the land parcel. The Proposed Development will provide a high quality residential development featuring a number of enhancements such as greater areas of public open space including landscape structural planting and increased public access to the landscape. As a result, fields will be subject to a **Major Adverse** effect as a result of the noticeable change and loss of its openness and agricultural character.
- 3.8.18 Stone walls that currently in part define the fieldscape will be lost as part of the Proposed Development and are not replaced as part of the proposals, therefore resulting in a **Major Adverse** effect due to the total loss of this feature.
- 3.8.19 The land parcel and its immediate context will be subject to the newly built form of the development. The new high quality residential uses within the land parcel will respond to the landform with the proposed built form designed to reflect the local character and set within a comprehensive GI framework that will provide a number of benefits to include increased recreation, public open space, a greater variety of habitat and enhanced biodiversity across the land parcel, albeit at year 1 this will be limited. This will result in a **Major / Moderate Adverse** effect due to the noticeable change on the Site and its Immediate Context.
- 3.8.20 The remainder of landscape receptors will be subject to either adverse or beneficial effects that are of **minor or negligible** significance including:
- Hedgerows will be subject to a **Negligible Beneficial** effect; the Proposed Development will not affect any hedgerow, which will all be retained and protected.
 - Trees will be subject to a **Negligible Beneficial** effect as the proposed landscape strategy proposes a notable number of trees within the public open space and wider green infrastructure, that will substantially increase the tree cover within the land parcel.
 - Field Ponds will be subject to a **Negligible Beneficial** effect as the existing ponds will come under a new maintenance regime which will provide a degree of enhancement. In addition to this a number of new ponds will be created as part of the sustainable drainage system.
 - The Development will occupy a very small part of the much larger NCA 36 – **Negligible Adverse** effect.
 - The Development will occupy a limited part to the north of the RLCT/LCA28 – **Negligible adverse** effect.
 - the Development will have an indirect effect on a very limited part of the much larger RLCT/LCA29 – **Negligible adverse** effect.

Visual Effects

- 3.8.21 Four visual receptors are likely to experience effects that are considered significant (i.e. typically effects that are either major or moderate significance) as a result of the completed development.
- 3.8.22 People using the PRoW that pass within the Hollingworth Road land parcel (LitFp251, LitFp427, LitFp436, LitFp444, and LitFp437), from which there will be clear views of the development. The design of the Proposed Development includes a comprehensive green infrastructure network within which the existing PRoW will be retained and in part redirected, with a number of additional routes providing an enhanced network. As a result, there will be a **Major Adverse** significance of effect.
- 3.8.23 Residential properties in proximity to the Hollingworth Road land parcel: Smithy Bridge will have partial views of the immediate built form adjacent to the land parcel boundary. The design of the Proposed Development is such that the proposed dwellings form a continuation of existing settlement pattern, reflecting the form, layout and scale. The Proposed Development will cause a noticeable change in views to those properties in proximity with partial views of residential dwellings in the land parcel. As a result, there will be a **Moderate Adverse** significance.
- 3.8.24 People travelling along Hollingworth Road will have views of the new built form and associated new road junctions will be visible across the view, continuing the development frontage along Hollingworth Road which is currently present to the south. The development will alter the composition of predominantly pastoral fields bound by stone walls within an undulating landform replaced by a new high quality residential development set within a robust green infrastructure. As a result, there will be a **Major Adverse** significance of effect on users as they pass adjacent to the land parcel.
- 3.8.25 Residential properties within Littleborough in the local area to the north have views of new high quality built form located on the higher ground that overlooks the proposed public open space. The proposed dwellings that form the edge of the development on the higher ground will be constructed with traditional stone materials and set back beyond native hedgerow with trees and seen on the skyline with the proposed landscape planting providing minimal mitigation and grounding of the built form at year 1 which will be seen on the skyline and contrast with the existing residential development adjacent to the land parcel. As a result, there will be a **Moderate Adverse** significance of effect.
- 3.8.26 The remainder of visual receptors will be subject to adverse effects that are not considered to be significant, including:
- People travelling along PRoW in the local area to the north-west (LitFp250, LitFp247 and Rochdale Canal) will have partial to glimpsed views of the built form on higher ground, as the receptor moves closer to the land parcel the nature of the landform will result in the views reducing to a glimpse. This will result in a **Minor Adverse** effect.
 - People travelling along Lake Bank to the south of the Hollingworth Road land parcel will have at most heavily screened winter views of the development with increased screening in the summer when the intervening vegetation is in full leaf. This will result in a Negligible Adverse effect.
 - People using Hollingworth Lake, travelling along Rakewood Road / PRoW LitFp447 – any glimpsed new development will be seen in the context of the existing intervening built form along Lake Bank and associated with Smithy Bridge and result in a barely perceptible change to the view. This will result in a **Negligible Adverse / Neutral** significance of effect.

- People travelling along PRoW in the local area to the south east (LitFp473) will have partial to glimpsed views of the built form on higher ground, which will be seen in the context of the existing development at Smithy Bridge. The Proposed Development will be a continuation of the existing built form on the higher ground associated with Brown Brow Hill and Smithy Bridge, there by not drastically changing the composition of the view or the skyline. This will result in a **Minor Adverse** effect.
- People travelling along PRoW in the wider area to the east (LitF525, LitFp527, LitFp524, and LitFp539) will have long distance partial views of the completed development which will be seen in the context of the existing built form which will let it assimilate into the receiving landscape and not be out of character. The Proposed Development will cause a limited change to the nature of the view and will not alter its composition. This will result in a **Negligible Adverse** effect.
- People travelling along PRoW in the wider area to the south (MilFp190) will have long distance partial views of the completed development on the higher ground within the western part of the land parcel, which will be seen in the context of the existing built form which will let it assimilate into the receiving landscape and not be out of character. The development will cause a very limited change to the nature of the view and will not alter its composition. This will result in a **Negligible Adverse** effect.
- People travelling along PRoW in the wider area to the north west (LitBp101 and LitFp174) will have long distance partial views of the completed development which will be seen in the context of the existing built form which will let it assimilate into the receiving landscape and not be out of character. This will result in a **Negligible Adverse** effect.

3.9 Mitigation Measures

Construction Phase

- 3.9.1 The following additional mitigation measures (secondary mitigation) are proposed for landscape and visual effects relating to the construction stage. These measures are generally considered to be construction industry standard and would be implemented through a Construction Environmental Management Plan ('CEMP') as set out in Chapter 5, which will be secured through a suitable worded planning condition.
- Existing vegetation on and around the land parcel will be protected from damage in accordance with BS 5837: 2012¹⁰;
 - Hours of work at the site will be limited to 07:30 – 19:00 hours Monday to Friday; 08:00 – 13:00 hours Saturday; and no time on Sundays, Bank Holidays or Public Holidays, thereby limiting the extent to which construction activities will affect receptors on a daily or weekly basis;
 - All unloading of construction materials and equipment will be provided within the site boundary, limiting adverse effects on character and views due to activities outside of the Site;
 - Noise, dirt and dust levels will be kept to a minimum and local roads will be cleaned regularly where dirt is spread by construction traffic, limiting adverse effects on local character due to the perception of construction activities; and

¹⁰ British Standards Institution (2012) 'Trees in relation to design, demolition and construction. recommendations', Trees in relation to design, demolition and construction– Recommendation, 4th Ed. doi:10.3403/30213642.

- Litter within and around the Site will be removed and the Site will be kept free from litter throughout construction activities.

3.9.2 Whilst the above measures will assist in reducing the perceived adverse effects of the construction of the development, the primary cause of adverse effects is considered to be the loss of openness changes to the physical fabric of the landscape. As such the secondary mitigation measures set out above will not alter the landscape and visual effects.

Operational Phase

3.9.3 In terms of operational effects, the establishment and growth of planting proposals and their ongoing maintenance and the management of existing landscape features are considered as further mitigation measures (secondary mitigation) and form the basis of the assessment of residual landscape and visual effects of the Development during the operational phase at Year 15. A Landscape Ecological Management Plan (LEMP) will be secured via a planning condition to ensure planting reaches its full maturity.

3.10 Residual Effects (Year 15)

Construction Phase

3.10.1 Whilst the additional mitigation measures identified will assist in reducing the perceived adverse effects of the construction of the Proposed Development, the primary cause of adverse effects is considered to be the loss of openness and changes to the physical fabric of the landscape. As such the additional mitigation measures will not alter the overarching significance of the previously identified landscape and visual effects and the significant effects reported will remain.

Operational Phase – Year 1

3.10.2 In most cases adverse significant effects will reduce over time as the embedded planting establishes itself and reaches its designed intention through on-going management. As such, the mitigation measures proposed will make a limited contribution to reducing adverse effects at Year 1. In this regard, the assessment of the residual effects of the Development is considered for Year 15 of the Operational Phase.

Operational Phase – Year 15

3.10.3 The following section summarises the anticipated residual effects of the Proposed Development on landscape and visual receptors at Year 15 of operation (i.e., 15 years after construction of the Development has been completed). These judgements take into account the successful establishment of all proposed planting across the land parcel, and the enhanced management of existing landscape features.

Landscape Effects

3.10.4 The establishment of the landscape strategy and mitigation planting will lead to tangible beneficial impacts. The now established proposed planting, including wildflower, shrub, hedgerow, and tree planting, with the addition of the waterbodies, will provide an enhanced green framework within which the development will be set. The green framework will define the new settlement edge and provide a sensitive and sympathetic transition between the urban grain and the adjacent land uses further to the east beyond Hollingworth Road. As a result, fields will be subject to a **Major Adverse** effect as a result of the noticeable change and loss of its openness and agricultural character.

3.10.5 Stone walls which currently in part define the fieldscape will be lost as part of the Proposed Development and are not replaced as part of the proposals, therefore resulting in a **Major Adverse** effect due to the total loss of this feature.

- 3.10.6 The Site and its Immediate Context will benefit from the landscape scheme having matured to provide an enhanced landscape setting that compliments the local landscape and settlement edge. Whilst the built edge will be extended, built development will be located within an increasingly robust extensive naturalistic parkland/mosaic landscape with an increased access to green space which overall improves the settlement edge, resulting in a **Moderate Adverse** significance of effect.
- 3.10.7 The remainder of landscape receptors will be subject to residual beneficial effects that are of **Minor, Negligible and Neutral** including:
- Hedgerows will be subject to a Minor Beneficial effect; new planting will have fully established improving the overall structure and cohesiveness of the receptor as a whole.
 - Trees will be subject to a **Minor Beneficial** effect as the established trees will improve the overall structure and cohesiveness of the receptor as a whole and provide a perceived enhancement and increase in canopy cover within the wider a green infrastructure network.
 - Field Ponds will be subject to a **Minor Beneficial** effect the existing pond will have been enhanced with the new waterbodies having established and providing a notable addition to these features within the land parcel.
 - The development will occupy a very small part of the much larger NCA36, with the development assimilating into the landscape within a strengthened green infrastructure network – **Negligible Adverse / Neutral** effect.
 - The development will occupy a limited part to the north of the RLCT/LCA28, and new planting as part of the development will have strengthened and will add to the existing character – **Negligible Adverse** effect.
 - The development will have an indirect effect on a very limited part of the much larger RLCT/LCA29, and new planting as part of the development will have strengthened and the materials will have weathered, allowing the development to assimilate further into the receiving landscape and reduce the urbanising influence on the adjacent RLCT / LCA – **Negligible Adverse / Neutral** effect.

Visual Effects

- 3.10.8 Three visual receptors are considered likely to experience significant residual effects (i.e. moderate adverse effect) as a result of the development at year 15.
- 3.10.9 People using the PRoW that pass within the land parcel (LitFp251, LitFp427, LitFp436, LitFp444, and LitFp437), from which there will be clear views of the development. The establishment of proposed landscape strategy planting will help mitigate visual effects. Planting of hedgerows and trees within the GI framework will lead to a softening and filtering of the proposed built form. As a result, there will be a **Moderate Adverse** significance of effect.
- 3.10.10 Residential properties in proximity to the Hollingworth Road land parcel: Smithy Bridge will have partial views of the immediate built form adjacent to the land parcel boundary. The establishment of a high quality development and streetscene, with street trees and hedgerows, which will have matured and provide a more robust landscape setting. In addition to this the enhanced pedestrian links through from Smithy Bridge will allow greater access to the public open space and recreational facilities. As a result, there will be a **Moderate Adverse** significance.
- 3.10.11 People travelling along Hollingworth Road will benefit from the establishment of proposed landscape planting that will soften and filter views of the built form and establish a mature

green framework within which the built form is set. As a result, there will be a **Moderate Adverse** significance of effect on users as they pass adjacent to the land parcel.

3.10.12 No further visual receptors are considered likely to experience significant residual effects following establishment of proposed planting at Year 15. However, visual receptors will be subject to Adverse residual effects that are either Minor or Negligible, or Neutral, and not considered to be significant, including:

3.10.13 The remainder of visual receptors will be subject to adverse effects that are not considered to be significant, including:

- People travelling along PRow in the local area to the north-west (LitFp250, LitFp247 and Rochdale Canal) - the establishment of proposed landscape strategy planting will help to mitigate visual effects. Planting of hedgerows and trees within the GI framework will lead to a softening and filtering of the proposed built form from the PRow. This will result in a **Minor Adverse** effect.
- People travelling along Lake Bank to the south of the Hollingworth Road land parcel – the landscape strategy includes a comprehensive green infrastructure network through the and around the land parcel which now established will soften/filter any glimpsed views of the development. This will result in a **Negligible Adverse** effect.
- Residential properties within Littleborough will benefit from the establishment of the landscape planting and the weathering of the built form will help soften and filter views of the built form, aiding in assimilating the development into the landscape. This will reduce the significance effects to Minor Adverse.
- People using Hollingworth Lake, travelling along Rakewood Road / PRow LitFp447 – this will reduce to Neutral as the material weathers on the built form and assimilates into the view further. This will reduce the significance effects to **Neutral**.
- People travelling along PRow in the local area to the south east (LitFp473) – the establishment of proposed landscape strategy planting will help to mitigate visual effects. Planting of hedgerows and trees along and around the proposed built form will soften and filter views. This will reduce the significance effects to **Negligible Adverse**.
- People travelling along PRow in the wider area to the east (LitF525, LitFp527, LitFp524, and LitFp539) – the establishment of proposed landscape strategy planting and weathering of the built form will further reduce visual impacts. This will reduce the significance effects to **Negligible Adverse / Neutral**.
- People travelling along PRow in the wider area to the south (MilFp190) – planting of hedgerows and hedgerow trees within the GI framework will lead to a softening and filtering of views and will strengthen the existing hedgerow network in view. This will reduce the significance of effects to **Neutral**.
- People travelling along PRow in the wider area to the north west (LitBp101 and LitFp174) – the establishment of proposed landscape strategy planting and weathering of the built form will further reduce visual impacts. This will result in a **Negligible Adverse** effect.

3.11 Cumulative Effects

3.11.1 Please refer to Volume 1: Chapter 10 for the Cumulative Effects assessment for both the Hollingworth Road and Rakewood Road land parcels.

3.12 Summary

- 3.12.1 An assessment of the likely landscape and visual effects arising from the Proposed Development has been undertaken in accordance with the Guidelines for Landscape and Visual Impact Assessment, Third Edition.
- 3.12.2 Review and analysis of national, county and district level published landscape character assessments has been carried out. The local character is described as a gently undulating agricultural landform consisting of both arable and pastoral farming. Field boundaries vary across the landscape, comprising mainly of gapped, low-lying native hedgerows and some well-defined native hedgerows along transport infrastructure with native hedgerow trees in-situ. The open nature of the landscape contrasts with other existing land uses including residential and industrial uses with major transport networks present within the local landscape.
- 3.12.3 Guidance set out in published character assessments includes measures to ensure that the sense of separation between settlements is retained, strengthen the hedgerow network, ensure that any development is in keeping with the form, density and vernacular of existing buildings, and seek to improve public rights to way to encourage sustainable travel.
- 3.12.4 A landscape appraisal has been undertaken to ascertain the existing character of the land parcel. The land parcel comprises a series of unremarkable agricultural fields that have been subject to heavy grazing with the historic stone walls that delineated the fields being unmanaged which has resulted in this feature being partially lost within the land parcel. The land parcel as a whole is influenced by the adjacent residential development of Smithy Bridge to the west. Furthermore, major transport routes, such as the railway line to the north, Hollingworth Road and Lake Bank to the east and south respectively, have reduced the tranquillity and remoteness of the immediate setting. Further to this the former Akzo Nobel Site that lies to the north east of the land parcel benefits from planning permission for residential use, and as such this will change the nature of the land parcel – although the scheme is considered within the cumulative effects.
- 3.12.5 The landform of the Hollingworth Road land parcel slopes from the western and eastern / northern boundaries, with the lowest point towards the north-western boundary. The landform to the east rises to Cleggswood Hill and to Hollingworth Lake and wider uplands to the south. To the north the landform falls to River Roch, within the local area, beyond which the landform steadily rises to north to Stubley Cross Hill higher ground.
- 3.12.6 The land parcel is unremarkable in terms of its landscape features, which predominantly consists pastoral fields delineated by stone walls, mainly located on the lower-lying eastern section and where they have been lost electric horse fencing. The only mature vegetation of note within the land parcel are the mature trees currently associated with the car park within the south eastern corner of the land parcel. There are opportunities to restore a number of landscape characteristic features of the land parcel and the local area, including new native hedgerows with hedgerow trees and individual trees and increase the number of waterbodies.
- 3.12.7 The land parcel has no landscape designations and has been subject to significant neglect and loss of its historic landscape features which has resulted in a degraded landscape character. The land parcel is contained by development and transport infrastructure and is no more than typical of the urban fringe landscape as identified by the published landscape character assessments. It is of medium landscape sensitivity.
- 3.12.8 A comprehensive series of mitigation measures has been embedded in the design of the development from the outset, with the aim of reducing adverse effects resulting from its introduction. The design of the development has evolved as part of an iterative process and has been informed by the findings of the baseline landscape and visual amenity conditions.

- 3.12.9 An assessment of the likely landscape and visual effects of the development has been undertaken during the construction phase and at Years 1 and 15 of the operational phase.
- 3.12.10 During the construction phase, three landscape receptors have been identified as being likely to experience significant Major to Moderate - Major Adverse effects. There will be the loss of agricultural fields, stone walls and the overall change to the character of the Site and its immediate context. This will also result in a number of visual receptors experiencing significant Major to Moderate Adverse effects, these include the users of the PRoW within the Site, users of the section of Hollingworth Road that runs parallel with the site boundary, residential properties immediate adjacent to the site boundary within Smithy Bridge and residential properties within the southern edge of Littleborough as a result of the construction activities being visible on the skyline and in contrast with the surroundings.
- 3.12.11 At Year 1 of operation, the same three landscape receptors have been identified as being likely to experience significant effects, the loss of fields, stone walls and therefore the overall character of the Site and its immediate context will result in a **Major to Major / Moderate** Adverse effects. Following the implementation and establishment of the comprehensive landscape mitigation strategy that underpins the development, the adverse effects to the fields and site and the Immediate setting will reduce to **Moderate Adverse** at Year 15 as proposed planting establishes and the quality of the open space improves. The loss of the stone walls will remain **Major Adverse**.
- 3.12.12 At Year 1 of operation, the same four visual receptors have been identified as being likely to experience significant effects, for users of the PRoW within the land parcel, users of the section of Hollingworth Road that runs parallel with the site boundary, residential properties immediate adjacent to the land parcel boundary with Smithy Bridge and residential properties within the southern edge of Littleborough as a result of the visibility of the new built form and the limited mitigation provided by the landscape proposals will result in a **Major to Moderate** Adverse effects. Following the implementation and establishment of the comprehensive landscape mitigation strategy that underpins the development, the adverse effects to users of Hollingworth Road will reduce to **Moderate / Minor Adverse** and residents within Littleborough will reduce to **Minor Adverse** at Year 15 as proposed planting establishes, the quality of the open space improves and the materials weather allowing the built form to assimilate into the landscape further. The effects on users of the PRoW within the land parcel and residents adjacent to the immediate western boundary will remain **Moderate Adverse**.
- 3.12.13 With respect to cumulative effects, the development has been assessed alongside the following cumulative schemes: Former Akzo Nobel Site (brownfield), The Soccer Village, Wildhouse Lane, Milnrow (partially brownfield), Land To The West Of New Street Littleborough, and Land West Of Smithy Bridge Road, Littleborough. On this basis, the cumulative effect during construction for LCT: Pennine Foothills (West/South Pennines) LCA 28 - Rochdale and South Oldham Pennine Foothills is judged to have a Small magnitude of effect and is considered to have a **Minor Adverse** Magnitude of Effect during construction and Year 1 reducing to **Negligible Adverse** at year 15.
- 3.12.14 The close proximity of the Proposed Development and the cumulative scheme at Former Akzo Nobel Site means there is the potential for cumulative effects on the immediate setting. The cumulative effects of both schemes on this receptor are not considered to exceed that identified for the Development on its own and therefore the cumulative effect is considered to be **Moderate - Major Adverse** significance of effect during construction, should the construction activities be ongoing within the Former Akzo Nobel site at the commencement of construction within the Hollingworth Road land parcel. If the development has been completed then the effects would reduce. The mature planting proposed within both schemes will have matured, allowing the proposed built form within both sites to assimilate further into the setting and provide an enhanced settlement edge with high quality development and landscaping. As a result, the nature of change will reduce, resulting in a Very Small magnitude of effect and the significance of effect will be **Moderate Adverse**

- 3.12.15 The Proposed Development has been designed to respond to the sloping landform and existing landscape features. The built form has been set back beyond landscape buffers to respond to local character and provide mitigation to the more visually sensitive residential dwellings, PRow and roads within the immediate setting, local and wider area. The development includes a mitigation strategy that reinforces a number of characteristic features through extensive hedgerow, hedgerow tree and tree planting as a means to softening and integrating the development. This proposed planting has been designed to strengthen the existing vegetation framework to provide a higher degree of containment to the development once established.
- 3.12.16 The landscape strategy includes measures that will not only mitigate effects but provide enhancements to the existing character and ecological value of the Site, creating a more diverse range of habitats, with the current agricultural use replaced by areas of open space and parkland that will provide benefits in terms of recreation and wildlife.
- 3.12.17 Whilst the Proposed Development will result in adverse effects on landscape and visual receptors, these effects are limited to receptors within or immediate adjacent to the Site by the combination of the existing landform alongside the existing and proposed vegetation framework and inherent characteristics of the type of development in general. Furthermore, through the iterative LVIA process, the layout of the Proposed Development and the formulation of a comprehensive landscape mitigation strategy have been guided by a robust understanding and analysis of the Site and its landscape and visual context, with the aim of reducing or where possible avoiding significant landscape and visual effects.
- 3.12.18 As a result, the majority of residual adverse effects can be reduced to a level that is not significant, where there is still a significant effect this is due to the loss of the fields and stone walls as they will be lost through development and the inevitable change to the character of the land parcel and views from the PRow within the land parcel, residents and road users adjacent to the land parcel boundary that will now experience views set within a more urban context. However, effects quickly reduce as the distance from the land parcel increases with the scheme provides tangible and beneficial significant effect on the landscape character of the Site in the long term.

3.13 References

- Department for Communities and Local Government. (2000). Environmental Impact Assessment – A Guide to Procedures.
- Department for Environment, Food and Rural Affairs. (2011). Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Available at: <https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services>. Accessed Jun 2024.
- Department for Levelling Up, Housing and Communities (2023). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf. Accessed June 2024.
- Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2023). Planning Practice Guidance. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>. Accessed June 2024.
- Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2019). Planning Practice Guidance: Natural Environment. Available at: <https://www.gov.uk/guidance/design>. Accessed June 2024.

- Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2024). Planning Practice Guidance: Environmental Impact Assessment. Available at: <https://www.gov.uk/guidance/natural-environment>. Accessed June 2024.
- Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2020). Planning Practice Guidance: Environmental Impact Assessment. Available at: <https://www.gov.uk/guidance/environmental-impact-assessment>. Accessed June 2024.
- Institute of Environmental Management and Assessment. (2011). Special Report – The State of Environmental Impact Assessment Practice in the UK. Available at: <https://www.iema.net/articles/the-state-of-eia-practice-in-the-uk>. Accessed Jun 2024.
- Institute of Environmental Management and Assessment. (2016). Environmental Impact Assessment Guide to: Delivering Quality Development. Available at: <https://www.iema.net/download-document/328273>. Accessed Jun 2024.
- Landscape Institute, Institute of Environmental Management and Assessment. (2013). Guidelines for Landscape and Visual Impact Assessment (GLVIA3), Third Edition.
- LUC. (2018). Greater Manchester Landscape Character and Sensitivity Assessment. Available at: <https://www.greatermanchester-ca.gov.uk/media/1727/greater-manchester-landscape-character-and-sensitivity-report.pdf>. Accessed Jun 2024.
- Natural England (2014) National Character Area profiles. Available at: <https://nationalcharacterareas.co.uk/>. Accessed Jun 2024.
- Oldham Metropolitan Borough Council, Rochdale Metropolitan Borough Council, Oldham Rochdale Partners in Action Housing Market Renewal. (2019). The Design and Planning Process: A Guide to Good Practice. Available at: <https://www.rochdale.gov.uk/downloads/file/552/design-and-planning-process-good-practice-guide-spd>. Accessed Jun 2024.
- Oldham Metropolitan Borough Council, Rochdale Metropolitan Borough Council, Oldham Rochdale Partners in Action Housing Market Renewal. (2007). Oldham and Rochdale Urban Design Guide. Available at: https://www.oldham.gov.uk/downloads/file/1070/oldham_and_rochdale_urban_design_guide_supplementary_planning_document. Accessed Jun 2024.
- Oldham Metropolitan Borough Council, Rochdale Metropolitan Borough Council, Oldham Rochdale Partners in Action Housing Market Renewal. (2007). Residential Design Guide. Available at: https://www.oldham.gov.uk/downloads/file/1071/residential_design_guide_supplementary_planning_document. Accessed Jun 2024.
- Rochdale Borough Council. (2016). Rochdale Adopted Core Strategy. Available at: <https://www.rochdale.gov.uk/downloads/download/266/core-strategy>. Accessed Jun 2024.
- Rochdale Borough Council. (2012). Pennines Green Infrastructure Action Plan. Available at: https://consultations.rochdale.gov.uk/strategic-planning/pennines_gi_action_plan/supporting_documents/20120411_Pennines_GI_March_2012.pdf. Accessed Jun 2024.

4 Hydrology and Drainage

4.1 Introduction

- 4.1.1 An assessment of the likely significant effects of the Proposed Development at the Hollingworth Road land parcel on the hydrological environment – including flood risk, surface water alterations and local drainage infrastructure during the construction and operational phases – has been undertaken by Betts Hydro Ltd. In accordance with Regulation 18(5) of the EIA Regulations, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in **Volume 1, Appendix D**.
- 4.1.2 This chapter describes the baseline conditions at the Hollingworth Road land parcel and the surrounding area, the methods that will be used to assess the effects and the mitigation measures required to prevent, reduce, or offset any significant negative effects. The chapter also reports the likely residual effects after these mitigation measures have been adopted.
- 4.1.3 As the Hollingworth Road land parcel is over 1 hectare (ha) in size there is a requirement for the planning application to be supported by a full Flood Risk Assessment (FRA) in accordance with the National Planning Policy Framework (NPPF). The potential surface water and foul water drainage management measures for the Hollingworth Road land parcel have also been considered in line with national and local policy requirements (**Volume 3, Appendix C.1**).
- 4.1.4 The demolition, construction and operational phases of the Proposed Development at the Hollingworth Road land parcel have been considered with regards to the likely significant impacts to the water environment (including flood risk and drainage). The potential changes that may arise due to the development include:
- Increase in flood risk due to an increase in impermeable areas;
 - Increase in flood risk associated with existing downstream, inadequate, under capacity, surface water infrastructure;
 - Detriment to water quality on-site and downstream, due to an increase in suspended sediment contaminants entering the surface water infrastructure; and
 - Increase in foul water flows associated with residential and educational uses and their potential impacts to capacity constraints on downstream receptors.

4.2 Legislation, Policy, Guidance and Standards

- 4.2.1 This assessment has been undertaken in accordance with the following legislation, policy, and guidance.

Water Resources Act (1991) and associated legislation (Water Industry Act and Land Drainage Act)

- 4.2.2 This legislation consolidates the previous water legislation and sets out the regulations and restrictions that provide protection to the water environment. It also places responsibility on landowners for maintaining flows in land drainage, and sets out the powers and duties of the water and sewerage companies, to ensure proper operation of sewage facilities through application of Section Agreements for example.

Environment Act (1995)

- 4.2.3 This legislation establishes the functions, rights, and liabilities of the Environment Agency, which was established on 1 April 1996 under the Environment Act 1995. The Environment

Agency's main aim (as defined in the 1995 Act) is to protect or enhance the environment, contributing towards the objective of achieving sustainable development through its role. The Environment Agency has statutory responsibilities in relation to the collection and dissemination of environmental information, assessing the environmental impacts of pollution, and promoting an understanding of methods for environmental and flood risk protection and management.

Flood and Water Management Act (2010)

- 4.2.4 The 2010 legislation makes provisions relating to the water industry, including establishment of the management of potential risks in connection with flooding.

Building Regulations Approved Document H (Drainage and Waste Disposal) (2015)

- 4.2.5 The 2015 legislation gives guidance for compliance with the Building Regulations for work carried out in England, and it ensures that adequate sewerage facilities are in place for correct disposal.

The Water Act (2014)

- 4.2.6 This legislation amends the Water Industry Act (1991) and sets out the powers and duties of the water and sewerage companies. The 2014 Act makes provision regarding the water industry including main river mapping, records of waterworks, regulation of the water environment, provision of flood insurance, information on internal drainage boards and Regional Flood and Coastal Committees.

National Planning Policy Framework (2023)

- 4.2.7 The NPPF provides guidance for local planning authorities (LPAs) and decision-takers about planning applications. The 'meeting the challenge of climate change, flooding and coastal change' section provides policies to encourage development away from areas at highest risk of flooding and guidance to direct local authorities to apply a sequential, risk-based approach to the location of development to avoid, where possible, flood risk to people and property.

Planning Practice Guidance (2014)

- 4.2.8 The Flooding and Coastal Change section of the PPG sets out guidance to ensure that inappropriate development in areas at risk of flooding is avoided by directing development away from areas at highest risk but, where development is necessary, making it safe without increasing flood risk elsewhere. Minor changes have been made over the years, with the most recent update being in 2021.

Sustainable Drainage Statement (2014)

- 4.2.9 The 2014 Statement, published by the UK Parliament, makes arrangements for LPAs to consult with Lead Local Flood Authorities (LLFAs) in relation to the surface water run-off management. The Statement also puts focus on the use of sustainable drainage systems for new developments to promote sustainable and appropriate surface water management.

Non-statutory technical standards for sustainable drainage systems (2015)

- 4.2.10 This guidance document, produced in 2015 by DEFRA, contains non-statutory technical details for the design, maintenance, and operation of sustainable drainage systems. For new development, it is important that the rate of surface water run-off is reduced at the source

(through infiltration); such an approach mimics the natural drainage regimes and will reduce the likelihood of flash flooding occurring in local public sewerage and drainage systems.

Rochdale Borough Council Core Strategy (2016)

- 4.2.11 The Rochdale Core Strategy, which was adopted in 2016, states that development should not be situated in areas liable to flooding or where it would increase risk of flooding. The Core Strategy explains that new development must not interfere with the ability of agencies to carry out flood control works and maintenance or adversely affect the integrity and continuity of tidal or fluvial flood defences. The document goes on to state that development proposals can only be deemed acceptable when impacts of surface water run-off have been considered.
- 4.2.12 Core Strategy Policy G8 ('Managing water resources and flood risk') provides guidance on appraising, managing, and reducing flood risk in all new developments, through avoiding inappropriate development in flood risk areas.

Rochdale Borough's Strategy for Flood Risk Management (2014)

- 4.2.13 Rochdale Borough's Flood Risk Management Strategy sets out how the LLFA will collaborate with communities at risk of flooding and all organisations that have a role in managing and reducing flood risk. The Strategy also outlines the Council's approach towards flood risk, and it details how a series of longer-term investments and partnership projects and on-going activities around maintaining drainage assets, improving awareness of flood risk in communities, and engaging with residents and businesses, will increase local resilience.

Strategic Flood Risk Assessment for Greater Manchester (2019)

- 4.2.14 The Level 1 SFRA was undertaken in accordance with the Planning Policy Statement 25 Development and Flood Risk and informs the application of the Sequential Test and the Exemption Test regarding the use of existing flood data. The assessment focuses closely on the (then) emerging and existing site allocations in Greater Manchester, susceptible to a range of flood risk (fluvial, tidal, sewer overflow, groundwater, and surface water flooding), and provides flood management strategies to reduce the overall risk. The SFRA also identifies the key objectives in terms of Sustainable Drainage Systems (SuDS), which will be used within the Proposed Development and the supporting drainage plans.

Greater Manchester Surface Water Management Plan (2012)

- 4.2.15 The Surface Water Management Plan is a study of surface water flood risk, recognising the cause and effect of flood hazards between districts and communities in Greater Manchester. The plan focuses on the potential areas of significant risk – known as 'surface water hotspots', which present a challenge given the potential shared issues and responsibilities between districts – and which will require collaboration within their local strategies.

4.3 Consultation

- 4.3.1 We consulted with the Environment Agency (EA), United Utilities, RBC and The Canal and River Trust (CRT) on multiple occasions between 2019 and 2021. These discussions identified the scope of works required for the full FRA and Drainage Management Strategy (DMS) which has been prepared to support this chapter (see **Volume 3, Appendix C.1**).
- 4.3.2 The NPPF advises that the LPA in this case RBC) should consult with the EA, which will provide advice and guidance on flood issues at a strategic level and in relation to planning applications. RBC also acts as the LLFA in the case of the Hollingworth Road land parcel. It is the LLFA's statutory right to advise and provide guidance on sustainable drainage management requirements for all new developments.

- 4.3.3 Consultations with the EA, United Utilities, RBC and the CRT have not highlighted any historical flooding directly to the Hollingworth Road land parcel (see correspondence in the full FRA and DMS report included within **Volume 3, Appendix C**).
- 4.3.4 The Rochdale Canal is a private asset and, as such, consent for any proposed works to this asset will be required from the asset owner. Early consultation with the CRT has been carried out to ascertain ownership and terms for a potential new formal surface water drainage connection(s) to the Canal to serve the Hollingworth Road land parcel. A pre-development response from CRT has confirmed that it would allow a connection into the Canal at a restricted discharge rate of 13.5l/s.

4.4 Methodology

- 4.4.1 The full methodology for categorising flood risk for the Hollingworth Road land parcel is described within the FRA and DMS report (included within **Volume 3, Appendix C.1**); this section of the chapter provides a summary for completeness. The assessment of flood risk and drainage has been conducted in accordance with the requirements of the NPPF and the supporting PPG.
- 4.4.2 The assessment has considered the significant impacts to the Hollingworth Road land parcel and those resulting from the Proposed Development, while considering the construction (and demolition) and operational phases independently. The assessment has also considered the potential impacts associated with the increased run-off rates and volumes generated by the Hollingworth Road land parcel.

Study Area

- 4.4.3 This assessment focuses on the Hollingworth Road land parcel; however, where required, consideration is also given to the potential risk from/to areas neighbouring the land parcel, particularly where historic flooding or flooding susceptibility is identified which may impact the Hollingworth Road land parcel.
- 4.4.4 Baseline information was compiled from a variety of sources including consultations, flood mapping, sewer records and other published flood risk/drainage sources of information, using multiple methods including desk-based study, research, and fieldwork to identify and assess the significance of known receptors.

Baseline Data Collection

- 4.4.5 A site-specific FRA and DMS report has been produced to support the planning application for the Hollingworth Road land parcel (**Volume 3, Appendix C.1**). Furthermore, a Catchment Hydrological Assessment has been undertaken for the Hollingworth Road land parcel, to support the overall assessment (Appendix C.3). General information regarding the site setting and baseline conditions have been obtained from the following sources:
- Google Earth and Bing Mapping (2024);
 - Environment Agency Flood Mapping (2024);
 - Long-term Government Flood Risk Mapping datasets (2024);
 - Site visit conducted by Betts Hydro (2019);
 - United Utilities sewer records (2019);
 - Various consultation responses (2018 - 2022);
 - Cranfield soil and Agrifood Institute, Soilscape Viewer (2023);

- British Geological Survey mapping data (2023); and
 - SusDrain Guidance Documents (2012).
- 4.4.6 The desk-based studies prepared to support this chapter have identified the existing catchment characteristics and the associated pressures/constraints. The existing surface water hydrology around the Hollingworth Road land parcel (where relevant) has also been identified. Historic information relating to flooding, susceptibility to flooding, and drainage has also been obtained for the land parcel area.

Assessment

- 4.4.7 This section of the chapter describes the framework for assessing the Hollingworth Road land parcel in terms of magnitude of effect, sensitivity of receptors and overall significance of effects.

Sensitivity of Receptor

- 4.4.8 The sensitivity of receptors has been considered within the assessment in accordance with the sensitivity definitions used within this assessment as outlined in **Table 4.1**. The sensitivity of the receptor is dependent upon several factors including legislation and policy, the ability of the receptor to absorb changes without significant effects on its function/health and the existing pressures on the receptor. A receptor can be equally sensitive to change if its status is low and its ability to recover from change would be limited; or if it is of a high quality and therefore more resilient to change but is a highly valued resource.

Table 4.1 Defining Sensitivity of Receptor

Sensitivity	Definition
High	The receptor is of high value and/or protected by national or international legislation. The receptor/resource has limited or no ability to absorb change without fundamentally altering its present status/quality. Existing pressures on the receptor may be such that a minor change in the baseline could tip the balance and lead to significant impact.
Medium	The receptor/resource has moderate capacity to absorb change without significantly altering its present character. Existing pressures on the receptor are such that small impacts will not tip the balance.
Low	The receptor/resource is of limited value and/or tolerant of change without detriment to its existing character.

Magnitude of Change

- 4.4.9 Magnitude can be described as the level of change against the baseline conditions. The magnitude of effects will be considered within the assessment in terms of the likelihood of whether an effect will occur and the spatial or temporal spread of such an effect. The magnitude criteria developed for this chapter are based on the definitions as outlined in **Table 4.2**.

Table 4.2 Defining Magnitude of Change

Magnitude	Definition of Magnitude
High	An acute and large, short-term change with the potential for long term secondary effects; or a chronic but long-term or permanent change to the baseline conditions. Any effects would be detectable over a large area, and it would mean the proposed development is not in accordance with standard policy/legislation.
Moderate	A change to the baseline conditions that occurs over the short or long term but does not qualify as a high magnitude as described above.

	The effects may be contrary to guidance or objectives set by statutory or non-statutory stakeholders.
Low	A measurable but small scale, temporary impact to the water environment with no lasting effects. Any effects are confined to the immediate surroundings of the proposed development and although a detectable change has occurred, it is still in line with the relevant policy and guidance.
Negligible	No measurable change against the baseline, where no feasible pathway can be established between the source and the receptor.

Duration of Effect

4.4.10 The duration of effects has been considered in terms of the criteria noted in **Table 4.3**.

Table 4.3 Defining Duration of Effect

Timescale	Definition
Short term	0 to 2 years including the construction period and on completion
Medium term	2 to 5 years including mitigation establishment
Long term	5 to 10 years including long term operation of the development

Significance of Effect

4.4.11 The significance of an environmental effect is determined through the interaction between the sensitivity of the receptor and the magnitude of change. The impacts can be both negative and/or positive and **Table 4.4** outlines the significance matrix which has been considered as part of the assessment.

Table 4.4 Matrix for Assessing Significance of Effect

		Sensitivity of Receptor			
		High	Medium	Low	Negligible
Magnitude of Impact	Major	Substantial	Major	Moderate	Minor
	Moderate	Major	Moderate	Minor	Negligible
	Minor	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible

4.4.12 The description of significance to be considered within the assessment is noted below:

- **Substantial: these are beneficial or adverse effects which impact upon the decision-making process.** Effects are associated with sites/features of importance that are likely to suffer a most damaging impact and/or loss of integrity. A fundamental change in a site or feature of importance may also enter this category.
- **Major: these are beneficial or adverse effects likely to be important considerations at a local scale.** They may become key factors in the decision-making process.
- **Moderate: these are beneficial or adverse effects which may be important but are not likely to be key decision-making factors.** Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.

- **Minor: these beneficial or adverse effects which may be raised as local issues.**
They are important in enhancing the design of the project, but unlikely to be critical in the decision-making process. Nevertheless, they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.
- **Negligible: no effects.** Or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error. Such effects should not be considered by the decision-maker.

4.4.13 For the purposes of undertaking the assessment in accordance with the EIA Regulations, effects determined to be moderate or greater are considered significant in EIA terms. These impacts have been considered further and mitigation measures have been introduced to reduce (and where possible, remove) such impact.

Assumptions and Limitations

4.4.14 The assessment has assumed that the downstream sewer and watercourse network has sufficient capacity to take the run-off generated by the proposed development and that any offsite downstream flood risk factors (outside of the control of the developer) are dealt with by the relevant asset owners.

4.5 Baseline Conditions

- 4.5.1 This section describes the water environment and features within the influence of the Hollingworth Road land parcel, and identifies their current quality, their importance, and their sensitivity.
- 4.5.2 Existing baseline information has been obtained from relevant organisations including the EA, RBC, United Utilities and the British Geology Survey (BGS) in respect of surface water drainage rates and geological conditions. Additionally, a site walkover was undertaken by Betts Hydro in March 2019 which confirmed that ground levels varied significantly across the Hollingworth Road land parcel.

Sensitive Receptors

4.5.3 Overall, the Hollingworth Road land parcel is within Flood Zone 1 as shown on current flood mapping data provided by the EA. The flood risk to the Hollingworth Road land parcel is therefore low and can be effectively managed through appropriate mitigation. The key flood risk mechanisms considered include:

- Fluvial risks from nearby watercourses;
- Surface water risks from existing developed areas adjacent to the site;
- Pluvial risks associated with adjacent undeveloped areas on-site; and
- Sewer related flood risk associated with the nearby public sewer network.

4.5.4 The receptors considered in this ES chapter include:

- a. **Neighbouring surface water features:** This includes the Main River (River Roch), the Rochdale Canal and Hollingworth Lake. As these receptors are near to the land parcel, they have been considered as having high sensitivity.
- b. **Neighbouring residential areas:** The Hollingworth Road land parcel is located to the north-east of Smithy Bridge and to the south of Littleborough. Due to the potential effects to public health and wellbeing, these receptors are of high sensitivity.

- c. **Neighbouring Transport Infrastructure:** The Hollingworth Road land parcel is located adjacent to Hollingworth Road and Lake Bank (road). As this receptor is directly adjacent to the Hollingworth Road land parcel, it has been considered as having medium sensitivity.
- d. **Construction workers** are of high sensitivity because, should potential risks not be managed effectively, there is a possibility of health and safety impacts.
- e. **Future residents/users of the site** are of high sensitivity due to the potential severity of the impacts if mitigation is not implemented.
- f. **Neighbouring Untied Utilities sewer infrastructure** includes surface water, foul water and combined assets located on-site and within the neighbouring residential areas. The proposals, as outlined within the FRA and DMS (**Appendix C.1**), highlight a direct link into this infrastructure in terms of surface water and foul water management. It is therefore considered to be a receptor of high sensitivity.

Flood Risk

- 4.5.5 The flood risk from fluvial, tidal, surface water and artificial flood sources has been considered as part of the assessment; however, consultation with the EA, United Utilities, RBC and the CRT has not identified any historical flooding at the Hollingworth Road land parcel due to fluvial and/or other sources.
- 4.5.6 The nearest Main River (as designated by the EA) to the Hollingworth Road land parcel is the River Roch, located 450m to the north. Main Rivers are typically rivers with contributing catchments greater than 2 sq.km as defined by the EA.
- 4.5.7 Flood mapping also identified Featherstall Brook (Main River) located 500m to the north of the Hollingworth Road land parcel and another Main River located 600m to the south-east of the land parcel. There are no Ordinary Watercourses (catchments too small to be considered as a Main River by the EA) located near to the Hollingworth Road land parcel.
- 4.5.8 The Flood Zone Maps provided by the EA confirm that the Hollingworth Road land parcel is located within Flood Zone 1 and is at little to no risk from fluvial (and / or tidal) flooding. This means there is less than 0.1% chance of fluvial/tidal flooding in any year.
- 4.5.9 The proposals are mostly residential in nature (except for the proposed primary school). In accordance with the PPG, the most vulnerable element of proposed mixed-use schemes should be considered across the entire scheme in terms of classifying vulnerability; the Proposed Development is therefore considered to be 'more vulnerable' in terms of the Annex 3: Flood Risk Vulnerability Classification, within the NPPF. The PPG confirms that this type of land-use is appropriate for Flood Zone 1, providing there is no increase in flood risk elsewhere as a result of the Proposed Development at the Hollingworth Road land parcel.
- 4.5.10 The Hollingworth Road land parcel is at low to high risk from surface water flooding based on the findings of the FRA and DMS (**Volume 3, Appendix C.1**). The areas within the Hollingworth Road land parcel that are at highest risk from surface water flooding are associated with naturally low-lying depressions, which act as a conveyance route. This route is neighboured by elevated land and would therefore be susceptible to ponding in the extreme storm events especially if downstream receptors are at capacity.
- 4.5.11 The flood mapping reviewed as part of the full assessment shows that some parts of the Hollingworth Road land parcel are at risk of flooding associated with an upstream reservoir dam breach / failure. While this risk is typically considered as residual (due to the maintenance and management regimes in place catering for large artificial bodies of water), the potential risk has been considered in line with the current planning proposals, as discussed within the full FRA and DMS (**Volume 3, Appendix C.1**) report.

- 4.5.12 In terms of standard design, it is typical for 'more vulnerable' development located within Flood Zone 1 to set the Finished Floor Levels (FFL) above the external ground levels (150 mm). Raising the FFLs sufficiently above the external levels (following any re-grade) should mitigate any risk of flooding from a variety of sources, including groundwater and surface water run-off risks at the proposed development.

Drainage

- 4.5.13 The Hollingworth Road land parcel covers 18.85 ha of land, but the total area being considered for development covers 12.4 ha.
- 4.5.14 In terms of the existing ground conditions, the Cranfield Soil and AgriFood Institute (CSAI), Soilscape viewer identifies the soils to be 'slowly permeable, seasonally wet, acid, loamy and clayey soils'. The BGS mapping indicates that the main ground conditions comprise Pennine Lower Coal Measures Formation at bedrock level with superficial deposits of till, diamicton and sandstone. Given the presence of underlying coal measures in the sub-geology and this geographical area's mining history, a full infiltration-based solution is not likely to be practical due to the high potential for leaching of contaminants from the underlying coal measures.
- 4.5.15 The nearest waterbody to the Hollingworth Road land parcel is the Rochdale Canal, located to the north. At present most of the run-off generated by the land parcel would naturally convey towards the north and would either directly discharge overland into the Rochdale Canal or utilise the existing adjacent infrastructure to do so.

Baseline Evolution

- 4.5.16 There is a requirement within the EIA Regulations for the do-nothing scenario to be considered with regards to potential flood risk and drainage implications. A do-nothing scenario looks at whether flood risks or drainage issues would be present in the future if the proposed development were not to be constructed, so in other words to consider the natural evolution of the baseline without the proposed development. The baseline scenario is assessed with reasonable effect based on the availability of environmental information and scientific knowledge.
- 4.5.17 In a do-nothing scenario it is considered that there would be the potential for the level of current flood risk and drainage issues to be increased due to hydrological changes associated with climate change predictions. Although definitive predictions are not possible, assumptions and estimations can be made to allow assessment of the predicted effects to the baseline in a do-nothing scenario.
- 4.5.18 It is likely that the natural drainage systems on-site will be put under further strain with the potential for increased rainfall intensity and frequency leading to additional run-off within the natural and man-made drainage systems. Pressures will be placed on these natural and man-made drainage systems resulting in a greater likelihood of exceedance and increased surface water flood risks on and adjacent to the site.
- 4.5.19 In a do-nothing scenario, the River Roch and the Rochdale Canal, located to the north of the site, would remain in their current condition and continue to take run-off naturally generated on the site in an uncontrolled manner. When the potential implications to hydrology due to climate change are considered, there would be potential for increased risks of downstream flooding in a do-nothing scenario. The reasons is because the rainfall intensity is likely to increase as a result of climate change and at present most of the site naturally drains to the north in an uncontrolled manner.

4.6 Primary and Tertiary Mitigation

- 4.6.1 As noted within Volume 1 of the ES and in accordance with Regulation 18(3)(c) of the EIA Regulations and guidance from IEMA, this assessment takes account of primary mitigation

which is inherent in the Proposed Development design, and tertiary mitigation, which refers to actions that would occur to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.

- 4.6.2 Further details with respect to the mitigation measures proposed can be found in the supporting FRA and DMS within **Volume 3, Appendix C**.

Primary Mitigation

Construction Phase

- 4.6.3 Surface water run-off will be controlled by a suitable temporary surface water drainage system prior to commencement of construction activities to mitigate the potential flood risk and sediment loading on the Hollingworth Road land parcel and to the identified downstream receptors. Full detailed design work will be undertaken to confirm the technical details including the specific temporary drainage systems to be implemented to serve the Proposed Development during the demolition and construction phases.
- 4.6.4 In accordance with the SuDS drainage hierarchy, the temporary surface water management solution would be to discharge to a watercourse if infiltration is not feasible. As noted, infiltration is unlikely to be possible at the Hollingworth Road land parcel due to the steep gradients, and underlying ground conditions. Therefore, the temporary surface water drainage strategy during this phase is to discharge into the Rochdale Canal located to the north of the land parcel, subject to agreement with the CRT for any temporary outfall(s).
- 4.6.5 The temporary drainage systems will be implemented prior to construction activities and will be designed to cater for the existing flows and conveyance routes at the Hollingworth Road land parcel. Construction workers will also be made aware of the potential flood risks and appropriate evacuation requirements.
- 4.6.6 During the construction phase, surface water run-off will be controlled to mitigate the potential increase in flood risk, and measures can be implemented within the temporary drainage regime to reduce the potential for sediment loading.
- 4.6.7 To minimise the effect from construction activities on water quality, construction traffic should be managed effectively as per the details contained within the transport chapter (Volume 2: Chapter 7). Interceptors should be incorporated within the temporary drainage system to trap any pollutants before they are able to enter downstream surface water receptors.
- 4.6.8 The temporary drainage system will be maintained until the operational drainage system is completed, at which time the temporary system will be decommissioned where necessary and the operational drainage systems will cater for run-off generated by the completed development.

Operational Phase

- 4.6.9 Green/blue corridors have been incorporated to help ensure that existing conveyance routes are maintained where practical. An intra-site sequential approach has been taken to locating the Proposed Development within the wider site extents, whereby the more vulnerable elements of the Proposed Development have been located within areas at least flood risk from the variety of sources reviewed as part of the FRA.
- 4.6.10 The typical requirement for safeguarding more-vulnerable development is to raise the FFL above the predicted Top Water Level in the 1% Annual Exceedance Probability plus an allowance for climate change. As the Hollingworth Road land parcel is located within Flood Zone 1 and not at risk of fluvial flooding, the FFLs will be steered by other engineering constraints to conform to best practice and design standards.

- 4.6.11 An appropriate surface water drainage regime will be implemented at the Hollingworth Road land parcel to cater for the increased surface water run-off generated during the operational phase. This will in turn reduce the likelihood of any increased surface water flood risks to identified receptors; full details of the drainage regime can be viewed within the submitted FRA and DMS (**Volume 3, Appendix C.1**). The management regime will follow the drainage hierarchy and discharge surface water in accordance with the standard guidance:
- Discharge to ground (if not feasible following further testing); then
 - Discharge to the watercourse will be considered; and then
 - Discharge to the public sewer network would only be considered as a last resort should all other approaches be reviewed and discounted.
- 4.6.12 Furthermore, given the mining history, there is potential for further engineering constraints to be present, restricting the location of soakaway features within the Hollingworth Road land parcel. This issue would also be exacerbated due to the steep gradients currently present in parts of this parcel. Considering the above, the full FRA and DMS report (**Volume 3, Appendix C.1**) has looked at the alternatives for sustainable surface water management, in accordance with the drainage hierarchy.
- 4.6.13 As noted above, infiltration will not offer a full practical surface water drainage solution for the site, and therefore in accordance with the drainage hierarchy it is proposed to discharge surface water run-off to the Rochdale Canal. At present most of the run-off generated by the wider Hollingworth Road land parcel would naturally convey towards the Canal. The proposed drainage strategy will be to continue to do so via a new formal connection into the Canal, at a restricted rate to mimic the pre-development regime.
- 4.6.14 The Canal is a private asset and so consent for works to this asset will be required from the asset owner. The CRT has confirmed that it would allow a connection into the Rochdale Canal at a restricted discharge rate of 13.5l/s, which minimises the potential risks associated with the increased surface water run-off as a result of the development. The proposed surface water drainage system will be sized to contain run-off from storm events up to and including the 1 in 100 year return period storm event with a 45% allowance for climate change on-site.
- 4.6.15 In accordance with the NPPF, SuDS should be specified wherever possible to manage surface water, in turn reducing the burden downstream on the identified receptors. SuDS features will be implemented within the Hollingworth Road land parcel, including permeable surfaces and bio-filtration where feasible (subject to ground investigation and a detailed level review). It is proposed that SuDS in the form of swale(s)/basin(s) will be used to provide attenuation and conveyance benefits. Initial design work has been undertaken as part of a due diligence exercise to illustrate that a positive outfall to the Canal, at the agreed rate of restriction, can be achieved.
- 4.6.16 The proposed surface water drainage regime referenced in the full FRA and MS report in **Volume 3, Appendix C.1** details how the proposed mitigation will direct surface water run-off from the development through multiple SuDS swales/basins within the Hollingworth Road land parcel, which will help to mitigate the potential impact to surface water retained. Catchpits (or other) interception methods will also be incorporated into the drainage infrastructure to help remove sediment and other contaminants from impacting upon downstream surface water receptors.

Tertiary Mitigation

Demolition and Construction Phase

- 4.6.17 All construction works will be designed in accordance with the latest best practice guidelines. Method statements should be agreed with the EA prior to construction to ensure surface run-

off quality is managed during the construction phase in compliance with the latest PPG. Contractors undertaking earthworks will develop risk assessments, method statements and a full construction management plan in accordance with standard practice to cover all aspects of their work, which have the potential to cause physical damage to structures, mobilise large quantities of soil / sediments or block open watercourses. Refer to the outline Construction Environment Management Plan (CEMP) prepared and submitted with this assessment for further information with regards to practices being implemented.

- 4.6.18 A variety of good environmental practices will be implemented in accordance with the EA's *Pollution Prevention guidelines* and *CIRIA 532 Control of Pollution from Construction Sites* to minimise any effects associated with water quality and ecology. A detailed CEMP will be developed prior to commencement of works, incorporating the methods and measures discussed above.

Operational Phase

- 4.6.19 It is important that, should any drainage systems not be offered for adoption to either United Utilities or RBC, then an appropriate maintenance regime should be scheduled with a suitably qualified contractor for these private drainage systems. Appropriate maintenance of surface water infrastructure will be conducted to ensure that a build-up of sediment in attenuation features does not result in increased risks. The detail of how these features will be managed has not yet been agreed, although an appropriate maintenance plan will be prepared as part of detailed design works.

4.7 Assessment of Likely Effects

- 4.7.1 The significance of effects on the drainage and flood risk potential that could result during the demolition, construction and operational phases (following the implementation of the Primary and Tertiary mitigation measures noted above) is assessed below.

Construction

- 4.7.2 The risk associated with flooding will be most prominent during the construction phase given that, at such a time, the proposed post-construction mitigation measures will not have been implemented across the Hollingworth Road land parcel. There is therefore the potential for measures to not be fully implemented as the construction activities are being conducted, although a temporary drainage system is proposed to be implemented during this phase to deal with most potential effects.

Increased Flooding Potential

- 4.7.3 The Hollingworth Road land parcel is located solely within Flood Zone 1. Based on the reviewed flood mapping, the primary source of flood risk to the Proposed Development during the construction phase would be from surface water. There is the potential for increased surface water run-off to be generated at the Hollingworth Road land parcel due to the construction activities, including movement of mobile (and static) construction vehicles, earthworks (excavations), construction of temporary and permanent infrastructure and roads, and formation of public spaces and landscaping.
- 4.7.4 The increased surface water will have the potential to affect the Hollingworth Road land parcel itself and any upstream and downstream identified receptors. During the construction phase, surface water run-off will be controlled within the temporary drainage regime to mitigate for the potential increase in flood risk and sediment loading.
- 4.7.5 If the capacity of the temporary drainage system installed at the Hollingworth Road land parcel were to be exceeded (due to unforeseen circumstances), then there could be the potential for increased flood risks to downstream and upstream receptors. This effect would have a

moderate adverse effect, leading to short-term major significant effects on receptors with high sensitivity.

- 4.7.6 Furthermore, where construction activities on-site differ from those anticipated during the design, then they may alter the natural flow routes and increase sediment mobilisation. Increased sediment, if conveyed off-site through the natural processes, would result in increased sedimentation in the downstream receptors and therefore an increased surface water flood risk. Increased surface water flood risks are likely to be of moderate magnitude, which would lead to a short-term, major adverse significant effect on receptors of high sensitivity.
- 4.7.7 Whilst not identified as a source of flood risk at the Hollingworth Road land parcel, groundwater can potentially have significant effects when the construction phase is underway as excavations begin and unanticipated naturally high-water tables are found to be present. If shallow groundwater is identified, particularly during excavation work, then there is potential risk to construction workers, which would result in a minor adverse effect should mitigation measures not be in place.

Impacts on Water Quality

- 4.7.8 As with surface water run-off, there would be the potential for surface water contamination from the Hollingworth Road land parcel and thus environmental impacts could result from the construction phase of the development to downstream receptors. A variety of good environmental practices will be implemented to minimise any effects associated with water quality and ecology. A detailed CEMP will also be developed prior to commencement of works. In doing so, all major and moderate effects identified above would be reduced to negligible.

Operational Phase

- 4.7.9 The likely significant effects during the operation phase should be effectively mitigated by implementing the proposed mitigation measures outlined within the supporting FRA and DMS (**Volume 3, Appendix C.1**) and noted in the Primary and Mitigation section above (Section 4.7).

Increased Flooding Potential

- 4.7.10 There are some existing areas of the Hollingworth Road land parcel at high surface water risk due to naturally low-lying depressions which act as conveyance routes. Due to the nature of the proposed development and the associated impermeable areas, surface water run-off generated on-site will inherently increase.
- 4.7.11 To minimise flood risk to the neighbouring properties and the proposed dwellings it is proposed to formally manage the surface water run-off generated by the Hollingworth Road land parcel during operation. Any discharge rates will be required to mimic the existing regime to ensure no increase flood risk in comparison to the existing situation.
- 4.7.12 If an extreme rainfall event were to exceed the design criteria for the drainage system (above that which has been accounted for in the typical design requirements), or other unforeseen circumstances (such as poor maintenance or downstream capacity implications), then it is likely that there could be exceedance beyond the designed drainage capacity and therefore an increase in flood risk. The potential for increased flooding at the Hollingworth Road land parcel during the operational phase is of moderate magnitude on receptors of high sensitivity, which would lead to a long-term, major significant adverse effect.

Impacts on Water Quality

- 4.7.13 The identified surface water receptors may still exist at the Hollingworth Road land parcel post-construction and therefore downstream receptors (that is, residential uses) may still be subject to increased sedimentation / pollutants from operational activities. However, due to the primarily residential nature of the proposals, the potential effect on water quality by increased or contaminated sediment would be negligible. This is because residential development – unlike commercial or industrial development, for example – is generally considered to comprise mostly domestic clean water from roof areas and limited trafficked areas (private driveways and estate roads).
- 4.7.14 During the operational phase, there will be an increase in traffic associated with the Proposed Development compared to the construction scenario, potentially causing an increase in fine particulates. In the event of heavy rainfall, the fine particulates from the heavily trafficked areas could potentially mobilise with the surface water run-off and enter the downstream watercourse / waterbody network. This could lead to the deterioration of the water quality on downstream surface water receptors including the Rochdale Canal.
- 4.7.15 The potential impacts and assessment of effects during both the construction and post-construction phases have been summarised in **Table 4.5** below.

Table 4.5 Summary of Assessment of Significance of Effects.

Receptor	Issue	Pathway	Magnitude of Impact	Sensitivity of Receptor	Significance of Impact	Nature of Effect: Adverse, Neutral or Beneficial	Effect: Direct or Indirect	Effect: Temporary or Permanent	Short, Medium, Long Term Effect
Development Demolition and Construction									
Surface Water Receptors – Ordinary Watercourses	Construction activities leads to increased surface water run-off flooding potential	Surface Water Run-Off	Minor	High	Moderate	Adverse	Indirect	Temporary	Short-Term
Surface Water Receptors - Main Rivers			Moderate	High	Major	Adverse	Direct/Indirect	Temporary	Short-Term
Construction Workers			Moderate	High	Major	Adverse	Direct	Temporary	Short-Term
Construction Activities such as excavations			Moderate	High	Major	Adverse	Direct	Temporary	Short-Term
Neighbouring development & Infrastructure			Moderate	Medium	Major	Adverse	Indirect	Temporary	Short-Term
Surface Water Receptors – Ordinary Watercourses	Sedimentation potential – impact on Water Quality	Surface water run-off	Minor	High	Moderate	Minor	Direct	Temporary / Permanent	Short-Term
Surface Water Receptors – Main Rivers			Moderate	High	Major	Adverse	Direct/Indirect	Temporary / Permanent	Short-Term
Neighbouring development & Infrastructure			Moderate	Medium	Moderate	Adverse	Indirect	Temporary	Short-Term
Surface Water Receptors – Ordinary Watercourse	Pollution potential from plant equipment and materials stored and operating on-site – impact on water quality	Surface Water run-off	Minor	High	Moderate	Adverse	Indirect	Temporary / Permanent	Short-Term/ Medium Term
Surface Water Receptors – Main Rivers			Moderate	High	Major	Adverse	Direct/Indirect	Temporary / Permanent	Short-Term/ Medium Term
Development Post Construction									
Surface Water Receptors – Ordinary Watercourse	Pollution –impact on water quality	Surface Water run-off	Minor	High	Moderate	Adverse	Indirect	Permeant	Medium-Term
Surface Water Receptors – Main Rivers			Moderate	High	Major	Adverse	Direct/Indirect	Permeant	Medium-Term
Surface Water Receptors – Ordinary Watercourse	Sedimentation – impact on water quality	Surface water run-off	Minor	High	Moderate	Adverse	Indirect	Permeant	Medium-Term

Receptor	Issue	Pathway	Magnitude of Impact	Sensitivity of Receptor	Significance of Impact	Nature of Effect: Adverse, Neutral or Beneficial	Effect: Direct or Indirect	Effect: Temporary or Permanent	Short, Medium, Long Term Effect
Surface Water Receptors - Main Rivers			Moderate	High	Major	Neutral	Indirect	Permeant	Medium-Term
Neighbouring development & Infrastructure	Increased flood risk from surface water run-off	Surface water run-off	Moderate	Medium	Moderate	Adverse	Indirect	Temporary	Short-Term
Surface Water Receptors – Ordinary Watercourse			Minor	High	Moderate	Adverse	Direct	Temporary	Short-Term
Surface Water Receptors - Main Rivers			Moderate	High	Major	Adverse	Direct	Temporary	Short-Term
Site Occupants / Users			Moderate	High	Major	Adverse	Direct	Temporary	Short-Term
Surface Water Receptors – Ordinary Watercourse	Improvement to Water quality / ecology due to use of SuDS within the PDS	Surface water management	Minor	High	Moderate	Beneficial	Direct	Permanent	Long-Term
Surface Water Receptors - Main Rivers			Moderate	High	Major	Beneficial	Direct	Permanent	Long-Term

4.8 Secondary Mitigation and Enhancement

Demolition and Construction Phase

- 4.8.1 Groundwater monitoring will take place as part of construction activities and excavations. If de-watering is required, then appropriate licences from the EA will be obtained prior to any commencement of works.
- 4.8.2 Full drainage details for the proposed temporary surface water drainage regime are not available at this time; however, it is anticipated that they will be implemented at the Hollingworth Road land parcel to collect, direct and attenuate surface water generated before discharging north into the Rochdale Canal. It is anticipated that sediment traps (or similar) will be used in any areas where there is a potential high probability of sediment mobilisation because of the construction activities.

Operational Phase

- 4.8.3 It would still be recommended that FFLs should be raised above external levels following any regrade to safeguard from residual overland flows. Typically, a 150 mm freeboard above the external ground levels is applied to mitigate any residual risk of flooding associated with other sources of flood risk, including surface water and groundwater. As some areas of the Hollingworth Road land parcel are shown to have a higher susceptibility to other sources of flooding (surface water and reservoir), it may be beneficial to increase the FFL freeboard to 300 mm in areas of high surface water flood risk and up to 600 mm in areas at risk of high risk of reservoir flooding to offer additional resilience. It would be for the LLFA to confirm its specific requirements in this case as part of a suitably worded condition attached to any subsequent planning approval.
- 4.8.4 Any overland flows generated by the Proposed Development at the Hollingworth Road land parcel must be carefully controlled. Safe avenues directing overland flow away from any existing and proposed buildings are advised.
- 4.8.5 Initial design work has been undertaken as part of a due diligence exercise to illustrate that a positive surface water outfall to the Canal, at the agreed rate of restriction, can be achieved. Full detailed design work will be undertaken in due course to confirm the technical details, which can be secured through the application of a suitably worded condition attached to any planning approval.
- 4.8.6 Existing natural conveyance features will be enhanced where they are proposed to be retained as part of the surface water management regime, improving conveyance and reducing the potential for blockage in future rainfall events. Catch pits (or other) interception methods will also be incorporated into the drainage infrastructure to help remove sediment and other contaminants from impacting upon downstream surface water receptors.
- 4.8.7 Appropriate maintenance of surface water infrastructure will also be carried out to ensure a build-up of sediment in the proposed attenuation features does not result in increased flood/water quality risks. The detail of how these features will be managed has not yet been agreed, although an appropriate maintenance plan will be prepared (as is required by planning condition) for the Hollingworth Road land parcel and its proposed drainage features as part of detailed design works in due course.

4.9 Residual Effects

- 4.9.1 The Hollingworth Road land parcel is located within Flood Zone 1, based on the EA's Flood Map for Planning. The assessment has identified that the flood risk from other sources is either low or can be effectively managed through mitigation measures proposed (including risk from surface water flood risks). Providing the mitigation measures noted within this

chapter (and the supporting FRA and DMS in **Volume 3, Appendix C.1**) are implemented, the likelihood of any significant residual effects impacting the development (or identified receptors) is low as indicated within the summary **Table 4.6**.

Table 4.6 Summary of Residual Effects

Description of Effect	Significance	Maximisation and Mitigation	Residual Effect
Demolition and Construction Phase			
Sedimentation potential – impact on Water Quality	A short-term, major adverse effect (without mitigation being implemented).	A detailed Construction Environment Management Plan which will be prepared prior to commencement of the construction phase. Good environmental practices will be implemented to minimise any potential for negative water quality effects of surface water run-off generated. Surface water run-off will be controlled during the construction phase to mitigate the potential for sediment loading. Working areas will be clearly marked to ensure minimal disturbance of sediment and installation of silt traps (or similar) would be recommended to provide another level of protection for any temporary drainage systems.	No Residual Effects will result from the proposals following the implementation of the mitigation measures proposed.
Pollution potential from plant equipment and materials stored and operating on-site – impact on water quality	A short-term, major adverse effect (without mitigation being implemented).	A Construction Environment Management Plan which will be prepared prior to commencement of the construction phase. Good environmental practices will be implemented Construction Environment Management Plan to minimise any potential for negative water quality effects of surface water run-off generated.	No Residual Effects will result from the proposals following the implementation of the mitigation measures proposed.
Construction activities leads to increased surface water run-off flooding potential	A short-term, major adverse effect (without mitigation being implemented).	A temporary drainage system will be implemented on-site to cater for surface water run-off generated during the demolition and construction phases. Appropriate environmental practices will also be implemented as per the Construction Environment Management Plan to minimise any effects of surface water run-off to collect, direct and attenuate surface water prior to discharging to the downstream receptors.	No residual effects will result from the proposals following the implementation of mitigation measures proposed.

Description of Effect	Significance	Maximisation and Mitigation	Residual Effect
Operational Phase Summary			
Pollution –impact on water quality	A short-term moderately adverse effect (without mitigation being implemented).	The proposals are to implement formal surface water management techniques to sustainably and effectively manage the surface water run-off generated by the development. The proposals are to use SuDS in the form of attenuation ponds/basins, these will provide significant additional benefits to water quality if design in accordance with best practice. These formal drainage systems will be designed in accordance with best practice which identify methods to minimise the potential for pollution such as petrol interception in heavily trafficked areas. An appropriate drainage/ SuDS maintenance plan will also be in force to cater for the maintenance and management of the on-site drainage systems which are not offered for adoption as part of the detailed design works. This can be secured by way of an appropriately worded condition attached to any subsequent planning approval.	Following the implementation of mitigation measures, no residual effects are anticipated, and the risk would be negligible
Sedimentation – impact on water quality	A short-term major adverse effect (without mitigation being implemented).	The proposals are to implement formal surface water management techniques to sustainably and effectively manage the surface water run-off generated by the development. The inclusion of SuDS will provide additional benefit in terms of sediment reduction providing they are designed appropriately. Furthermore, the on-site piped drainage lengths can include methods such as silt traps or interception ditches to capture additional sediment and allow for easy removal. The piped drainage systems will where feasible be offered for adoption meaning regular maintenance will be conducted by the relevant body. Where drainage systems are not offered for adoption, a maintenance plan will be prepared, and upkeep carried out by the approved management body.	Following the implementation of mitigation measures, no residual effects are anticipated, and the risk would be negligible.
Increased flood risk from surface water run-off	A short-term major adverse effect (without mitigation being implemented).	It is recommended that Finished Floor Levels should be raised above external levels following any regrade to safeguard from residual risks overland flow. Typically, a 150mm freeboard above the external ground level is applied to mitigate any residual risk of flooding associated with other sources of overland flow including surface water and groundwater. In the case of the proposed development, it has been suggested that a higher freeboard be incorporated in places with a higher residual risk of flooding. Furthermore, the proposals are to implement formal surface water management techniques to sustainably and effectively manage the increased surface water run-off generated by the development. This will ensure any potential future flood risk as a result in the increase in impermeable area is minimised.	Following the implementation of mitigation measures, no residual effects are anticipated, and the risk would be negligible

Description of Effect	Significance	Maximisation and Mitigation	Residual Effect
Improvement to Flood Risk Potential/Water quality /ecology due to use of SuDS	A long-term majorly beneficial effect	The proposals are to implement formal surface water management techniques to sustainably and effectively manage the surface water run-off generated by the development. The inclusion of SuDS will provide additional benefit in terms of water quantity management (thus reducing the potential for flood risk in the future) along with improvements to water quality and ecological benefits, providing they are designed appropriately. These on-site drainage systems will be appropriately managed as part of the sites SuDS management plan which will be prepared as part of the detailed design works.	Following the implementation of SuDS on-site, it is anticipated that positive residual effects will result due to the development proposals.

4.9.2 If an extreme rainfall event were to exceed the design criteria for the drainage system (above that which has been accounted for in the typical design requirements), then it is likely that there would be some resulting overland flows. It is important that these potential overland flows are catered for if the capacity of the drainage system is exceeded. The proposals are to incorporate safe flood flow routes through the site where attenuation in the extreme event can occur safely. The impact of this residual risk, therefore, would be negligible.

4.9.3 In conclusion, when the mitigation measures proposed within this chapter and the FRA and DMS in **Volume 3, Appendix C.1** are considered, the impacts on the water environment from the proposed development and impacts on the Proposed Development from a flood risk perspective are not significant.

4.10 Cumulative Effects

4.10.1 Please refer to **Volume 1: Chapter 10** for the cumulative effects assessment including both the Hollingworth Road and Rakewood Road land parcel.

4.11 Summary

4.11.1 The Hollingworth Road land parcel is shown to be predominantly at low flood risk from the variety of flood sources reviewed. The Flood Zone Maps provided by the Environment Agency confirm that the parcel is located within Flood Zone 1 and is at little to no risk from fluvial (and/or tidal) flooding. The proposals are mostly 'residential' in nature and as such is classified as 'more vulnerable'. The PPG confirms that 'more vulnerable' development is appropriate, providing there is no increase in flood risk elsewhere due to the proposals.

4.11.2 Due to the low flood risks identified in relation to the Hollingworth Road land parcel, the focus of the assessment was on the potential flood risks associated with surface water and the mitigation measures required to ensure that the development proposed does not increase flood risk elsewhere because of its construction. Overall, the proposals are to manage surface water run-off sustainably in accordance with the national and local planning requirements, and it is proposed that the drainage regime will mimic the existing situation where feasible.

4.11.3 There will be an increase in surface water run-off generated at the Hollingworth Road land parcel as the amount of impermeable area will increase due to the nature of the development proposed. This increase in surface water run-off, however, will not impact the neighbouring developments/schemes as the Hollingworth Road land parcel has been designed to mimic the pre-development situation and discharge to the adjacent canal at a restricted rate (as agreed with the CRT). SuDS are also incorporated into the proposed

drainage management regime to provide additional benefits to the proposed development including water quality, attenuation, and amenity/biodiversity value.

- 4.11.4 The proposed surface water drainage system for the Hollingworth Road land parcel will need to be sized to contain run-off from storm events up to and including the 1 in 100 year return period storm event (with a 45% allowance for climate change). SuDS features and public open space areas will assist with managing this additional run-off on-site prior to discharge. Seven SuDS basins/swale features have been included as part of the initial design works to provide a feasible, sustainable surface water management solution for the proposed development.
- 4.11.5 This assessment and supporting documentation, including the Flood Risk Assessment and Drainage Management Strategy (**Volume 3, Appendix C.1**), have been prepared in consultation with the relevant statutory consultees and those documents incorporate the consultees' comments where possible. The assessment is commensurate with the scale and nature of the proposed development and is in accordance with the NPPF and the supporting PPG.

4.12 References

- Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities – Environment Agency/DEFRA 2016
- CIRIA 522: Sustainable urban drainage systems – design manual for England and Wales (2000).
- CIRIA 523: Sustainable urban drainage systems – best practice manual (2001).
- CIRIA 609: Sustainable drainage systems. Hydraulic, structural and water quality advice (2004).
- CIRIA 624: Development and flood risk – guidance for the construction industry (2004).
- CIRIA 635: Designing for Exceedance in urban drainage: Good practice (2006).
- CIRIA 644: Building Greener (2007).
- CIRIA 753: The SUDS manual (2015).
- Flood Risk to People – Phase 2 (FD2321/TR2), DEFRA and the Environment Agency (2006).
- Flood estimation for small catchments: Institute of Hydrology Report No.124, NERC (1994).
- Flood Estimation Handbook, Centre for Ecology and Hydrology (1999).
- Planning Policy Statement 25: Development and Flood Risk (2006).
- Sewers for Adoption 7th Edition, WRc (2012).
- Technical Guidance to the National Planning Policy Framework, CLG (2022).
- Bing Maps -
- British Geological Survey – <http://www.bgs.ac.uk/opengeoscience/home.thml>

- Chronology of British Hydrological Events – www.dundee.ac.uk/
- CIRIA – <http://www.ciria.org/>
- Cranfield University – <http://www.landis.org.uk/soilscapes/>
- Environment Agency – www.environment-agency.gov.uk/
- FloodProBE – <http://www.floodprobe.eu/>
- Flood Forum – <http://www.floodforum.org.uk/>
- Flood London – <http://www.floodlondon.com/>
- Google Maps – <http://maps.google.co.uk/>
- Streetmap – <http://www.streetmap.co.uk/>
- United Utilities – <http://www.unitedutilities.com/default.aspx>

5 Ground Conditions

5.1 Introduction

- 5.1.1 Stantec UK Limited has prepared the Ground Conditions chapter in accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended.
- 5.1.2 This chapter assesses the likely effects that the Proposed Development may have on ground conditions, including land contamination and ground stability hazards. In addition, the chapter also considers the effect that the ground conditions may have on the Proposed Development, and it sets out the relevant policies, proposed approach and methodology used for the assessment of ground conditions effects. The chapter relates to the Hollingworth Road land parcel.
- 5.1.3 The author of the chapter is a Practitioner Member of the Institute of Environmental Management and Assessment (IEMA) and a Full Member of the Institution of Environmental Sciences (the IES). Stantec is also a corporate member of IEMA.
- 5.1.4 In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in Volume 2: **Appendix D**.

5.2 Policy Context, Legislation, Guidance and Standards

- 5.2.1 Government policy on land contamination aims to prevent new contaminated land from being created and promotes a risk-based approach to addressing historical contamination. Land contamination is regulated under several legislative regimes, including environmental protection, pollution prevention and control, waste management, planning and development control and health and safety. The following are particularly relevant to contaminated land regulation:
- Part 2A of the Environmental Protection Act 1990.
 - The Contaminated Land (England) Regulations 2006 and the Contaminated Land (England) (Amendment) Regulations 2012.
 - The Environmental Damage (Prevention and Remediation) Regulations 2015, as amended.
 - The Environmental Permitting (England and Wales) Regulations 2016, as amended.
 - The Water Resources Act 1991.
 - The Building Act 1984.
 - The EU Water Framework Directive (WFD) 2000.
- 5.2.2 Paragraphs 120, 174, 179, 183, 184 and 210 of the National Planning Policy Framework (NPPF) (DLUHC, 2023) relate to conserving and enhancing the natural environment. Paragraph 183 states that planning policies and decisions should 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)”.

- 5.2.3 The NPPF is supported by Planning Practice Guidance, including ‘Land Affected by Contamination’, published by the Ministry of Housing, Communities & Local Government (now known as the DLUHC) in 2019.
- 5.2.4 Local planning policy is set out in the Rochdale Adopted Core Strategy (RBC, 2016). The following policies are relevant to this assessment:
- G6: “Reducing the impact of pollution, contamination and land instability. We will reduce all forms of pollution, contamination and land instability in the borough, by:
 - f. Requiring that any risks arising from contaminated land or land instability, and appropriate actions to address these risks, are identified prior to any development taking place on that land and the identified actions taken;
 - e. Requiring that any risk to surface water and ground water resources from the disturbance of contaminated land be ascertained and preventative measures devised and carried out”....
 - DM1: “General development requirements. All development proposals, including changes of use of land and buildings, extensions and alterations, will be expected to demonstrate that they:
 - f. Do not have an adverse impact on health, through its impact or the effect of existing problems e.g. land contamination, or poor air quality;
 - i. Take account of ground conditions including unstable or contaminated land – where a potential risk exists, a survey should be carried out and any necessary remedial measures identified and carried out...”
- 5.2.5 The following core guidance documents provide the technical framework for identification, investigation and assessment when dealing with land potentially affected by contamination in a way that is consistent with government policies and legislation within the UK:
- Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance.
 - Land Contamination Risk Management (LCRM), which has replaced the archived Contaminated Land Research Report 11 (CLR 11) (EA, 2023).
 - The Environment Agency’s approach to groundwater protection [under review] (EA, 2018).
- 5.2.6 A more comprehensive description of the relevant technical framework for the assessment of land contamination and ground stability hazards is set out in the Stantec Desk Study in **Appendix D.2.**

5.3 Methodology

Study Area

- 5.3.1 The study area is the land within the Hollingworth Road land parcel boundary plus a surrounding distance depending on the likely zone of influence for each feature/receptor. The distances have been established using professional judgement:

- Land-uses (including those with the potential to generate significant contamination) – based on a review of mapping focussed on the Hollingworth Road land parcel and immediately adjacent (to 50m from the Hollingworth Road land parcel boundary), extended for large activities such as landfills up to 500m from the Hollingworth Road land parcel to provide a wider setting description.
- Controlled Waters – the area considered for groundwater and surface water is immediately beneath and adjacent respectively, noting that characteristics used to define the sensitivity of surface water and groundwater are the river basin catchment and aquifer designation and abstraction records within a 1km radius, respectively, which are for a much wider area.
- Ecological Setting – designated statutory and non-statutory ecological sites located within a 500m radius of the Hollingworth Road land parcel boundary.

Scope of the Assessment

5.3.2 The following potentially sensitive receptors are included within the scope of the assessment:

- Human health including construction workers, neighbours (primarily residential and recreational users of Rochdale Canal and Hollingworth Lake Country Park) and future end residential users of the Proposed Development;
- Controlled waters including groundwater and surface water quality;
- Ecological receptors, specifically the Rochdale Canal which is located approximately 20m northwest of the Hollingworth Road land parcel and is a designated SSSI and SAC. There are no designated ecological sites within the Hollingworth Road land parcel boundary, therefore the assessment will focus on the off-site designated Rochdale Canal;
- The built environment (proposed residential and infrastructure).

5.3.3 The following receptors are excluded from the scope of the assessment:

- Geological and geomorphological features of national and local interest are excluded on the basis that there are none located within or immediately adjacent to the Proposed Development; and
- Mineral resources – the Hollingworth Road land parcel is located within mineral safeguarding areas (MSAs) for brick clay, sandstone and coal; however, assessments are excluded on the basis that these reserves are highly likely to have been worked in the past. Further details are provided within the Mineral Resource Assessment prepared by Wardell Armstrong (2022), which is a standalone document forming part of the planning application submission.

5.3.4 Significant effects associated with land stability and ground collapse from the legacy coal mining activities in the local area are not considered to be likely and are therefore not assessed further. Details of the findings of the coal mining risk assessment are provided within **Volume 3: Appendix D.3**.

Consultation

5.3.5 This assessment has been informed by and prepared in accordance with the EIA Scoping Report prepared by Stantec in February 2023 and submitted to RBC, the EIA Scoping

Opinion issued on 26 June 2023 and the Scoping Request submitted to RBC on May 2024.
Table 5.1 below is a summary of consultee comments and Stantec's response.

Table 5.1 Summary of Scoping Opinion Comments and Stantec's Responses

Consultee	Consultee Comment	Stantec's Response
RBC Scoping Opinion	The nature of the development will not cause a significant risk to human health once completed and occupied. Best working practices are required to be carried out during construction to limit any risks to human health during the construction stage and will be secured as part of the CEMP	Noted.
	The Hollingworth Road land parcel is located within the Coal Mining High Risk Area. Records indicate the presence of a recorded mine shaft within 20m of the land parcel. Considering the nature of the development proposed, and on the basis that part of the land parcel is within the defined Development High Risk Area, the planning application should be supported by a Coal Mining Risk Assessment.	A CMRA has been prepared by Stantec in support of the planning application and is presented in Appendix D.3 . The risk from non-coal mining hazards has also been assessed in the CMRA.
	The Hollingworth Road land parcel adjacent to the Hollingworth Road land parcel, as defined by planning application 21/01146/FUL, was previously developed for industrial purposes, with remediation necessary to make that site suitable for residential development. Whilst the Hollingworth Road land parcel was not previously developed as part of the same use, it is in close proximity and therefore it is possible that contamination would be present on-site. The quantum and type of contamination at the adjacent site was such that it could be appropriately assessed as part of that submission, and controlled by conditions attached to the permission, and therefore it is reasonable to assume the same approach will be appropriate for the Hollingworth Road land parcel. The planning application will be accompanied by the appropriate ground investigation reports.	Stantec has undertaken a desk-based ground conditions assessment and a CMRA (Appendix D.2 and D.3 respectively) and a ground investigation has been carried out by a third party, Betts Geo Ltd, and has been reported in a ground investigation report (Appendix D.4)
	The adjacent site's previous use by AkzoNobel Chemicals Ltd means that the Hollingworth Road land parcel is within the HSE consultation area. The HSE has advised that if the previous planning permissions are revoked then these HSE consultation zones could in turn be removed. Given the changes in ownership and planning status of the former AkzoNobel site, it is not considered by Rochdale Borough Council that any permission remains extant for uses relating to hazardous substances and as such they would not present a risk to the Hollingworth Road land parcel.	Noted.

Baseline Data Collection

- 5.3.6 The baseline conditions described below are based on the findings of three assessments undertaken between 2019 and 2023 by Stantec and a third party.
- 5.3.7 A Phase 1 desk-based ground conditions assessment has been undertaken (Stantec, 2023a) in line with the EA's LCRM guidance (EA, 2023) and is reported in **Appendix D.2**.

The Stantec Desk Study includes two site reconnaissance visits carried out in 2022 and consultation with RBC to request pertinent environmental information and any available information relating to the adjacent former AkzoNobel chemical works and its recent remediation.

- 5.3.8 The Hollingworth Road land parcel is situated within a Coal Mining Reporting Area, with a small area identified as a Development High Risk Area shown adjacent to the northwest corner of the land parcel, according to the Coal Authority (2023). Therefore, it was considered necessary to undertake a Coal Mining Risk Assessment (CMRA) (Stantec, 2023b), which is reported in **Appendix D.3**. The CMRA presents a desk-based review of the available information on coal mining relevant to the Hollingworth Road land parcel and identifies and assesses the risks to the Proposed Development from legacy coal mining and identifies the appropriate mitigation measures to address coal mining issues.
- 5.3.9 Refer to the Stantec Desk Study and the Stantec CMRA for a comprehensive list of information sources used in the assessments (**Appendix D.2 and Appendix D.3**).
- 5.3.10 A ground investigation (GI) has been undertaken by a third party (Betts Geo Environmental Ltd, 2019) comprising a desk study and intrusive GI of the Hollingworth Road land parcel to develop a conceptual model of the land parcel, and inform a contamination risk assessment and a geotechnical assessment. The 2019 Betts Geo Report is presented in **Appendix D.4**. Of relevance to this assessment, the Betts Geo GI comprised:
- Nine window sampling (WS) boreholes to 4m below ground level (bgl) with eight ground gas monitoring installations to 3m bgl.
 - Twenty-five trial pits (TPs) were excavated to depths of between 3m and 4m bgl.
 - Soil samples were submitted for laboratory analysis of a range of chemical parameters and asbestos identification.
 - No sampling and laboratory analysis of the groundwater was undertaken due to the anticipated low risk to groundwater/aquifers due to the thickness of the cohesive superficial deposits encountered during the GI.
 - Six ground gas and groundwater level monitoring visits were undertaken over three months.
 - A small number of soil samples were submitted for geotechnical laboratory analysis.

Assessment Methodology

- 5.3.11 In order to evaluate whether the ground conditions could potentially lead to harmful consequences, a source-pathway-receptor methodology has been adopted:
- A source/hazard (a substance or situation, such as instability hazards) that has the potential to cause harm or pollution);
 - A pathway (a means by which the hazard moves along / generates exposure); and
 - A receptor/target (an entity that is vulnerable to the potential adverse effects of the specific hazard).
- 5.3.12 The significance of an effect is determined based on the sensitivity of a receptor and the magnitude of an impact. This section describes the criteria applied in this chapter to characterise the sensitivity of receptors and magnitude of potential impacts.

- 5.3.13 These terms have been adapted from those used in the Design Manual for Roads and Bridges (DMRB) methodology, including appraisal guidance documents LA 104 Environmental assessment and monitoring (Highways England, 2020a) LA 109 Geology and soils (Highways England, 2019) and LA 113 Road drainage and the water environment (Highways England, 2020b). DMRB is the only widely used industry guidance available that is relevant to the assessment of ground conditions, contamination and land instability in EIA.
- 5.3.14 The assessment methodology outlined below applies to both construction and operational (completed development) phases of the Proposed Development.

Table 5.2 Criteria Used in Ground Conditions for Classifying Receptor Sensitivity

Receptor Sensitivity	Description
Very High - Very high importance and rarity. International scale and limited potential for substitution	Human health: very high sensitivity land use such as where children are present, residential or allotments. Surface water: WFD status of Very High. Surface water features with hydrological importance to designated sensitive ecosystems such as sites protected/designated under the EC or UK Legislation (Special Areas of Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI)). Drinking water protected area (surface water). Groundwater: Principal Aquifer providing a regionally important public water supply. Groundwater associated with Source Protection Zone 1. Aquifer(s) with very high productivity and/or Water Framework Directive (WFD) Good status for groundwater quality and quantity. Water feeding Groundwater Dependent Terrestrial Ecosystem (GWDTE) with a high groundwater dependency and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs. Building/services: UNESCO accredited World Heritage Sites
High - High importance and rarity. National scale and limited potential for substitution	Human health: high sensitivity land uses where children may be present such as public open space. Surface water: WFD status of High. Surface water features with hydrological importance to designated sensitive ecosystems of national importance. Drinking water protected area (surface water). Groundwater: Principal Aquifer providing important resource or supporting river ecosystems, Source Protection Zone 2. Aquifer(s) with high/moderate productivity and/or WFD Good status for groundwater quality and quantity. Water feeding GWDTEs with a moderate groundwater dependence with high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs; or water feeding high groundwater dependent GWDTE with a national non-statutory UK Biodiversity Action Plan (BAP) priority. Ecology: CIEEM importance of national. Statutory designated sites: SSSI, National or Marine Nature Reserve (NNR or MNR). Building/services: Scheduled Monuments, Conservation Areas and Area of Historic Character. Grade I and II Listed Buildings.

Receptor Sensitivity	Description
Medium - Medium importance and rarity, regional scale	Human health: medium sensitivity land use such as commercial or industrial. Includes construction workers and ground workers. Surface water: WFD status of Moderate. Surface water features with hydrological importance to designated sensitive ecosystems of local importance. Groundwater: Secondary A Aquifer. Extensive non-licensed private water abstractions (i.e. feeding ten or more properties or supplying large farming / animal estates). SPZ3 (Outer Protection Zone) associated with licensed abstractions. Aquifer(s) with low productivity and/or a variable WFD status for groundwater quality and quantity. Water feeding GWDTEs of low groundwater dependence with a high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs; or water feeding moderately groundwater dependent GWDTE with a national non-statutory UK Biodiversity Action Plan (BAP) priority. Ecology: CIEEM Importance: County/regional. Statutory designated Local Nature Reserves (LNR). Non-Statutory* designated sites including Sites Important for Nature Conservation (SINCs), County Wildlife Sites (CWS), Local Wildlife Sites (LWS). Building/services: Area of Historic Character
Low - Low or medium importance and rarity, local scale	Human health: low sensitivity land use such as highways or railways. Surface water: WFD status of Low. Groundwater: Secondary B or Secondary Undifferentiated aquifer. Groundwater flow, yield and quality associated with small scale private water abstractions (i.e. feeding fewer than ten properties). Groundwater quality associated with SPZ3 associated with licensed abstractions and with licensed abstractions for which no SPZ is defined. Water feeding GWDTEs of low groundwater dependence with a national non-statutory UK BAP priority; or water feeding highly or moderately groundwater dependent GWDTE sites with no conservation designation. Ecology: CIEEM Importance: Local. Non-designated or priority habitats. Building/services: Buildings of local value/asset
Negligible - Very low importance/rarity, local scale	Human health: undeveloped surplus land/no sensitive land use proposed. Surface water: WFD status of Very Low or no WDF status. Groundwater: Unproductive strata. Very poor groundwater quality and/or very low permeability make exploitation of groundwater unfeasible. No active groundwater supply. Water feeding GWDTEs of low groundwater dependence with no designation or groundwater that supports a wetland not classified as a GWDTE, although may receive some minor contribution from groundwater. Ecology: No or little ecological value Building/services: Replaceable, recent construction individual dwelling. Assets with very little or no surviving historical interest.

*Non-statutory designated sites but may still afford a high level of protection by the local planning authority

Table 5.3 Criteria Used in Ground Conditions for Impact Magnitude (Change)

Magnitude	Assessment Criteria
Major adverse	Human health: significant contamination identified. Contamination levels significantly exceed background levels and relevant screening criteria (e.g., Sutable 4 Use Levels and Category 4 Screening Levels) with potential for significant harm to human health. Contamination heavily restricts future use of land. Surface water: Loss or irreparable impact of regionally important public surface water supply. Reduction in water body WFD classification (quality and/or quantity). Groundwater: Loss or irreparable impact on regionally important public groundwater supply. Reduction in water body WFD classification (quality and/or quantity). Loss of/extensive change to GWDTE or baseflow. Ecology: Significant permanent/irreversible damage to a biodiversity resource as a result of contamination from the Proposed Development. The extent, frequency and/or timing of an impact negatively affects the integrity or key characteristic of the resource. Buildings: Catastrophic damage to buildings, services and structures arising from land stability hazards, for subsidence (for example subsidence or ground collapse as a result of coal mine workings or landslides) which severely impact human health.
Moderate adverse	Human health: significant contamination which is widespread or localised with concentrations exceeding background levels and the relevant screening criteria. Remediation measures are required to reduce risks to human health/make land suitable for intended use. Surface water: Degradation of regionally important public water supply or loss of major commercial/industrial/agricultural supplies. Contribution to reduction in surface water body WFD classification. Groundwater: Reduction in water body WFD classification. Partial loss of the integrity of GWDTE. Ecology: Temporary/reversible damage to a biodiversity resource as a result of contamination from the Proposed Development. The extent, frequency and/or timing of an impact negatively affects the integrity or key characteristic of the resource. Buildings: Substantial damage to buildings, services or structures impacting human health arising from land stability hazards.
Minor adverse	Human health: sporadic or localised contaminants at potentially elevated concentrations marginally exceeding background levels and/or screening criteria. Best practice measures can be required to minimise risks to human health. Surface water: Minor effects on water supplies. Groundwater: Minor effects on an aquifer, GWDTEs, abstractions and structures Buildings: Minor damage to naturally significant/statutory (conservation area) structures through subsidence or similar effects. Ecology: Slight temporary/reversible damage to a biodiversity resource as a result of contamination from the Proposed Development. Buildings: Minor damage to buildings, services or structures unlikely to impact human health arising from land stability hazards.
Negligible	Human health: no requirement for control measures to reduce risks to human health. Surface Water: Very slight change from surface water baseline conditions. Groundwater: Very slight change from groundwater baseline conditions. Ecology: Very slight temporary/reversible damage to a biodiversity resource as a result of contamination from the Proposed Development. Buildings: Very slight observed effect on buildings, services or structures with no to impact human health.

Table 5.4 Significance Matrix

		Magnitude of Impact (with primary and tertiary mitigation taken into account)			
		Major	Moderate	Minor	Negligible
Receptor Sensitivity	Very High	Very Large	Very Large or Large	Large or Moderate	Slight
	High	Very Large or Large	Large or Moderate	Moderate or Slight	Slight or Negligible
	Medium	Large or Moderate	Moderate	Slight	Slight or Negligible
	Low	Moderate or Slight	Slight	Slight or Negligible	Negligible
	Negligible	Slight	Slight or Negligible	Slight or Negligible	Negligible

- 5.3.15 An effect determined as Moderate or above is typically considered Significant under the EIA Regulations; however, professional judgment can be applied. Minor and Negligible effects are considered Not Significant. Effects can either be adverse or beneficial.

Limitations

- 5.3.16 There are gaps in the ground conditions characterisation with limited or no ground conditions data where the school is proposed in the south west and central, north eastern and eastern portions of the Hollingworth Road land parcel in the locations of some of the proposed dwellings. The 2019 Betts Geo Report notes fieldwork constraints such as areas of the land parcel which were inaccessible during the GI; however, it is not certain which areas were inaccessible as they were not referenced in the report. It is understood at the time of writing that the further work recommended in the 2019 Betts Geo Report has not been undertaken. Further work recommended by Betts Geo and Stantec has been set out as secondary mitigation.

5.4 Baseline Conditions

The Hollingworth Road land parcel

Current Land Use

- 5.4.1 The Hollingworth Road land parcel predominantly comprises land used for grazing of horses and cattle with field boundaries enclosed by dry stone walls and hedgerows. The southeastern part of the land parcel comprises a public car park for visitors to Hollingworth Lake. Various site walkovers have been undertaken by Stantec (2023a) and a third party (Betts Geo, 2019) with the most recent visit in November 2022. Of relevance, the walkover surveys noted the building at Lower Cleggswood Farm (centre of the land parcel) to be in disrepair, with piles of waste (timber and household) present surrounding the farm, a plastic heating oil tank and a metal tank labelled "new oil" adjacent to the buildings. To the north of the farm and to the west of the track, a former small earthworks/quarry appeared to have been used to dispose of general farm waste, with plastic sheeting visible at the surface. Structural remains associated with the buildings at Brown Bank Top (north of the land parcel) and Heald Spring (south of the land parcel) were observed.
- 5.4.2 Topography is variable across the Hollingworth Road land parcel, which is characteristic of the surrounding landscape. Land falls away from a central ridge through the land parcel to the east and dropping steeply towards the Rochdale Canal to the north and rising to the west to a plateau.

Historical Land Use

- 5.4.3 **The Stantec Desk Study (Appendix D.2)** found that the Hollingworth Road land parcel has largely been used as agricultural land since the start of the available historical record period (1851). Pertinent features to this assessment include:
- Former sandstone quarry in the northwestern part of the Hollingworth Road land parcel.
 - Two likely former quarries, one in the east and one in the centre of the land parcel, located in the same locations that recent walkovers observed low-lying marshland and ground conditions with inclusions of possible waste such as timber and household waste.
 - Three wells on-site, two adjacent to Heald (former dwelling) in the southeastern part of the land parcel and one in the western part.
 - Three farms/dwellings labelled Lower Cleggs Wood (central location), Heald (south) and Brown Bank Top (north). Only Lower Cleggs Wood remains today.
 - A ground working is shown in the eastern part of the Hollingworth Road land parcel from 1930.
 - An embankment and a 'Water Metre' (which disappears from mapping dated 1949 onwards) on the southern boundary of the Hollingworth Road land parcel.
 - A Drain Conduit was shown to run across the Hollingworth Road land parcel from the off-site Hollingworth Reservoir northwards to the Rochdale Canal (feature only shown on mapping dated 1851).
- 5.4.4 Further details on the historical land use are contained within **Appendix D.2**.

Geology

- 5.4.5 The published records from the British Geological Survey (BGS) show that superficial deposits are largely absent from the western part of the Hollingworth Road land parcel, with Till deposits (unsorted and unstratified drift, generally overconsolidated) and Head deposits (gravel, sand and clay with local lenses of silt, clay, or peat and organic material) present in the eastern part of the land parcel.
- 5.4.6 The BGS indicates that the Pennine Lower Coal Measures Formation is present beneath much of the centre and southeastern part of the Hollingworth Road land parcel. The formation comprises mudstone and siltstone interbedded with fine- to medium-grained sandstone, subordinate seatearths and ironstone beds, marine bands and coal seams. The Milnrow Sandstone (fine-grained, ripple laminated, micaceous sandstone) and Darwen Flags (mainly medium-grained, cross-bedded or massive sandstone) form sandstone beds within the Pennine Lower Coal Measures Formation. The Milnrow Sandstone is shown on mapping in the central/western portion of the land parcel, as well as small portions in the eastern and southeastern parts of the land parcel. The Darwen Flags is shown beneath the far northern land parcel boundary.
- 5.4.7 Two faults are mapped at the Hollingworth Road land parcel which are generally oriented north-west to south-east, with one fault passing through the centre and another in the far eastern part of the land parcel.
- 5.4.8 There is an area of landslip shown on geological mapping (BGS, 2023) in the northern part of the Hollingworth Road land parcel. Landslips are a local feature of the Rochdale district

and are often associated with glacially oversteered valleys, faulting, and/ or stream rejuvenation in drift filled valleys. A buried (drift infilled) glacial meltwater channel is present off-site to the north, broadly following the valley of the River Roch, and the on-site landslip may be associated with this.

- 5.4.9 Betts Geo carried out a GI in May 2019 and encountered Glacial (Diamictic) Till – generally described as a soft becoming firm to stiff sandy gravelly clay – in most of the trial pits to depths of between 0.2m and over 3.5m. Localised bands of sand or sand and gravel were encountered in some of the Glacial Till. Beneath the Glacial Till, weathered sandstone was found at the surface in three locations in the west (TP09, TP10 and WS04) and encountered deeper between 1.2 and 3m bgl in the southwest and far north. Made Ground (anthropogenic ground) was encountered in three locations adjacent to the boundary with the former AkzoNobel chemical works at depths of up to 2.2m bgl. The presence of reworked ‘natural material’ was also inferred at the historical quarry to a depth of 2.3m bgl. The suspected quarry/Made Ground to the north of Lower Cleggswood Farm noted during the 2022 site walkover (Stantec, 2023a) was not targeted during the Betts Geo GI, and so no data is available for this area.

Controlled Waters – Hydrogeology

- 5.4.10 The following aquifer classifications have been given by the Environment Agency (EA):

- **Superficial**
 - Head deposits – Secondary A Aquifer “predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.
 - Till deposits – Secondary Undifferentiated “in general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type”.
- **Bedrock**
 - Pennine Lower Coal Measures – Secondary (A or B) Aquifer “Permeable layers capable of supporting water”.

- 5.4.11 The bedrock and superficial aquifers have been defined by the EA as ‘medium vulnerability’ groundwater which are “medium priority groundwater resources that have some natural protection resulting in a moderate overall groundwater risk. Activities in these areas should as a minimum follow good practice to ensure they do not cause groundwater pollution” (EA, 2017).

- 5.4.12 During the Betts Geo GI, groundwater was recorded at depths between 0.56m and 1.45m bgl in post-fieldwork groundwater monitoring. No comments were provided on the direction of groundwater flow. On the basis of a GI undertaken by WSP at the adjacent former AkzoNobel chemical works (WSP, 2006), groundwater in both the superficial and bedrock aquifers is indicated to flow to the northwest towards the River Roch. Groundwater behaviour may also be controlled by the faults and potential coal workings beneath the Hollingworth Road land parcel.

- 5.4.13 There are no recorded private water supplies or discharge consents to groundwater on-site.

Controlled Waters – Hydrology

- 5.4.14 The Groundsure Report obtained by Stantec for the Desk Study does not record any surface water bodies on-site and no surface water features were observed during the site

walkover. The 2019 Betts Geo Report indicates there are two recorded surface water bodies within the boundary of the Hollingworth Road land parcel; however, neither were identified during the site walkover by Stantec.

- 5.4.15 There are no recorded discharge consents or surface water abstractions within the land parcel boundary.

Geoenvironmental Hazards

- 5.4.16 The Stantec Desk Study (**Appendix D.2**) and the 2019 Betts Geo GI Report (**Appendix D.3**) have identified a number of historical and present-day sources of potential contamination, both within and outside of the Hollingworth Road land parcel boundary (the latter is discussed in the **Surrounding Area** section below).
- 5.4.17 The on-site sources include farmyard/farm buildings and associated tanks with potential for asbestos and for limited Made Ground, former infilled quarries, the operational car park in the southern part of the land parcel and the potential on-site migration of contamination from the former AkzoNobel chemical works immediately off-site. These land uses have the potential to produce a number of chemical, fibrous and gaseous contaminants, including herbicides and pesticides, hydrocarbons, asbestos, heavy metals, sulphates, ground gas and mine gas and volatile organic compounds (VOCs).
- 5.4.18 The Betts Geo GI identified elevated concentrations of lead and arsenic in natural Glacial Till soils collected from a depth of 2.5m bgl in the centre of the Hollingworth Road land parcel (see location TP20 on the plan in **Appendix D.4**). Loose fibres of asbestos (chrysotile and amosite) were detected in soil samples from made ground in the north eastern part of the land parcel (see locations TP07 and WS01 respectively) adjacent to the former AkzoNobel chemical works. The report concluded that the area where asbestos was encountered should be delineated through further GI, and that the elevated lead and arsenic in natural soils was likely a result of a laboratory error or cross contamination in the field, which should be confirmed through additional GI and risk assessment.
- 5.4.19 The groundwater was not considered to be at risk from contamination given the thickness of the cohesive Glacial Till across the Hollingworth Road land parcel. However, the thickness of the Glacial Till does vary across the land parcel and weather sandstone is recorded close to the surface in the centre and western part of the land parcel; it would therefore be prudent to collect ground water samples during more detailed GI given the proximity of the former AkzoNobel chemical works.
- 5.4.20 Due to the proximity of the former AkzoNobel chemical works to the north east of the Hollingworth Road land parcel, there is the potential for off-site ground gas to migrate onto the land parcel. A programme of ground gas monitoring was carried out by Betts Geo in 2019, comprising six visits to monitor the concentrations of carbon dioxide, methane, carbon monoxide and oxygen in eight monitoring wells. Two of the monitoring wells were vandalised (WS05 and WS08) and not considered to accurately reflect the ground gas regime of the land parcel. Locally, elevated concentrations of carbon dioxide areas were measured in the northwestern and central parts of the Site (WS01 and WS07, respectively) and significantly elevated concentrations of methane were recorded in the north east (WS01 and WS03).
- 5.4.21 The Betts Geo ground gas risk assessment concluded that ground gas protection measures will not be required across most of the Hollingworth Road land parcel. Based on the 2007 NHBC guidance traffic light system (which has now been superseded by the NHBC guidance issued in 2023), the northeastern and central parts of the land parcel are classified an 'Amber 2' area where high level gas protection measures are required, and the far northeastern corner of the land parcel is classified as a 'Red' area where remediation mitigation measures are required. To conclude, additional monitoring is

required in the northeastern and central parts of the Site where residential development is proposed, to confirm the appropriate gas protection measures.

Ground Stability Hazards

Coal Mining

- 5.4.22 The Hollingworth Road land parcel is situated within a Coal Authority Reporting Area with a small, identified Development High Risk Area shown adjacent the north-western corner, coincident with a former mine entry (shaft). Therefore, given the close proximity of the High Risk Area to the Proposed Development in an area of known former coal mining, a CMRA report (**Appendix D.3**) has been prepared to satisfy Coal Authority requirements. The CMRA includes an assessment of the risks to the Proposed Development (i.e. buildings and human health receptors) from mine entries, shallow mine workings, mining at depth and a limited assessment of mine gas.
- 5.4.23 Two coal seams were worked beneath the Hollingworth Road land parcel in the 1800s up to 1900 and are identified by the Coal Authority as the Upper Mountain and Lower Mountain seams at about 60m and between 96m and 110m depth (respectively). In addition to the coal, the seatearth underlying the Upper Mountain seam was extensively worked for the local brick, tile and pipe industry. A mine entry is shown on historical OS mapping and the Coal Authority's Consultants Report to be adjacent to north western corner of the land parcel and two further shafts recorded to the north eastern part of the land parcel within the former AkzoNobel chemical works (formerly 'Cleggswood Colliery').
- 5.4.24 The CMRA concludes that risks to the Proposed Development from coal and non-coal mining are low and that no significant potential mining legacy issues have been identified. No specific mitigation strategy has been proposed and there are no constraints or restrictions regarding the Proposed Development layout, other than in the far north-western corner where a suitable stand-off zone will need to be agreed with the Coal Authority, which is standard practice where mine entries are present. The Hollingworth Road land parcel, however, sits within a historical mining area and therefore there is a residual risk of unrecorded mine entries to be present on-site.

Landslide and Steep Slopes

- 5.4.25 An area of landslip is recorded on the published geology mapping (BGS, 2023) and an initial assessment of the risk has been made by Stantec (2023a). Steep slopes are also present in the northern part of the Hollingworth Road land parcel, sloping down to the canal, and along the central part of the land parcel, coincident with Heald Lane, sloping down to the northeast. A spring is labelled on historical OS mapping adjacent to Heald Lane. It is considered possible that spring lines could develop on this slope, which can cause instability. In summary, the risk is considered to be low, with a moderate risk in the area of landslip and where the topography is steeper. The landslip and areas of steep topography are not being considered for residential development.
- 5.4.26 The full findings of the preliminary land stability appraisal are contained within the Stantec Desk Study in **Appendix D.2**.

The Surrounding Area

Current Land Use

- 5.4.27 Of relevance, the surrounding land use is largely residential to the west and north, agricultural to the east and recreational to the south (Hollingworth Lake Country Park). Rochdale Canal is located immediately north of the Hollingworth Road land parcel with disused/public open space and residential land north of that. The former AkzoNobel

chemical works immediately northeast of the land parcel has been decommissioned, demolished and remediated (a summary of which is presented later in this section), and the land is currently in the development stage for the consented residential development.

Historical Land Use

- 5.4.28 The earliest available historical maps, dated 1851, indicate the surrounding land use to be largely agricultural. Hollingworth Reservoir is shown to the south, agricultural land is to the west and east, the canal and a railway line are shown to the north with Stubley (woollen) Mill beyond and an old pit and sandstone quarry are shown to the north east. Maps dated 1892 show the present-day reservoir to the north east of the Hollingworth Road land parcel has been constructed and two old quarries are labelled within 100m of the land parcel boundary. Other industrial land uses including Clough Fields Works and the Cleggswood Works where the former AkzoNobel chemical works was previously, Bridge Paragon Works to the west and a Sewage Works to the north west beyond the Rochdale Canal and the River Roch. In the early 1900s the Clough Field Works is still labelled as such and the Cleggswood Works is now labelled the Cleggswood Oil Distillery. Mapping dated 1967-1968 shows that the former AkzoNobel chemical works had expanded to the west towards the Hollingworth Road land parcel and the works had expanded further in mapping dated 1976, when the settlement of Smithy Bridge had expanded up to the western land parcel boundary.

Geology

- 5.4.29 The off-site geology is similar to that of the geology beneath the Hollingworth Road land parcel other than an area of alluvium which is recorded off-site to the north which is likely to be associated with the River Roch. Alluvium is a general term for clay, silt, sand and gravel which is an unconsolidated detrital material deposited by a river or stream as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain.
- 5.4.30 To the north east of the land parcel, where the former AkzoNobel chemical works was located, remediation works have been undertaken to improve the land and make it suitable for residential end use, in line with remediation strategies involving earthworks to excavate (and treat where necessary) the unsuitable soils and use clean infill where needed.

Controlled Waters – Hydrogeology

- 5.4.31 The following hydrogeological conditions have been identified within the surrounding area:
- Superficial
 - Till – Diamicton (on-site) – Secondary Undifferentiated
 - Head – Diamicton (on-site) – Secondary B Aquifer
 - Alluvium (off-site) – Secondary A Aquifer
 - Bedrock
 - Pennine Lower Coal Measures (on-site) – Secondary A Aquifer
- 5.4.32 Groundwater was encountered at depths between 1.0m-3.3m bgl in the Betts Geo GI and was recorded at depths between 0.56m-2.90m bgl in their post-fieldwork monitoring. On the basis of the ground investigation undertaken by WSP at the adjacent former AkzoNobel chemical works, groundwater in both the superficial and bedrock aquifers is indicated to flow to the north/northwest. Groundwater behaviour may also be controlled to some extent by the faults and potential coal workings beneath the Hollingworth Road land parcel.

Controlled Waters – Hydrology

- 5.4.33 A reservoir is located immediately east of the Hollingworth Road land parcel and Hollingworth Lake is located approximately 20m to the south. The Rochdale Canal runs along the northern boundary of the land parcel. The River Roch is located approximately 70m north of the land parcel and flows to the southwest. RBC's Scoping Opinion of June 2023 included information about the Proposed Development being in proximity to a feed supply from Hollingworth Lake to the Rochdale Canal; however, the exact location and proximity of the feed (presumably a pipeline) is unknown.

Ecological Systems

- 5.4.34 The Rochdale Canal on the northern boundary of the Hollingworth Road land parcel is a SSSI and a SAC for a significant population of floating water plantain and other diverse aquatic flora (JNCC, 2015).

Geoenvironmental Hazards

- 5.4.35 Land use was predominantly agricultural with some industry at the start of the examined period. The Rochdale Canal runs along the north-western boundary of the Hollingworth Road land parcel, with the Lancashire & Yorkshire Railway beyond. Hollingworth Lake, a reservoir built to supply the Rochdale Canal is present to the south of the land parcel. The land to the north/north east of the land parcel has been occupied by a range of industries including Cleggswood Works (Grease & Size), Cleggswood Oil Distillery to the north of the Rochdale Canal and the former AkzoNobel chemical works to the immediate northeast of the land parcel. To the southwest the land use has been predominantly residential, associated with the settlements of Smithy Bridge and Hollingworth, which expanded during the 1960s and 1970s, up to the boundary of the land parcel. To the east, the land use has remained predominantly agricultural.
- 5.4.36 Several off-site sources of potential contamination (SPC) have been identified in the Stantec Desk Study and the 2019 Betts Geo Report. These SPCs are summarised in **Table 5.5** below together with the associated contaminants of potential concern.

Table 5.5 Summary of Off-site Source of Potential Contamination and the associated Contaminants of Potential Concern

Source of Potential Contamination	Contaminant of Potential Concern
Former AkzoNobel Complex / Cleggswood Works (Grease & Size) / Clough Field Works (Oil & Tallow) / Cleggswood Oil Distillery (located immediately off-site to the north east)	Polycyclic aromatic hydrocarbons (PAH), Petroleum hydrocarbons, acids, heavy metals, Polychlorinated biphenyls (PCBs), phenols, combustion soots, ash, asbestos.
Landfills (located approximately 70m north east, 90m south west and 170m south east)	Asbestos, heavy metals and hydrocarbons within landfill materials, depending on composition of waste. Potential for hazardous ground gas from biodegradable/ organic inclusions.
Former coal workings including an old coal pit (located approximately 100m north) and the recorded mine entries (approximately 10m north west and 100m north)	Potential for coal-related contaminants including PAH, petroleum hydrocarbons, heavy metals, tars, phenols and the migration of mine gas from off-site shallow coal workings
Former paragon works (Steel) (approximately 200m west)	Metals, acids, PAH, VOCs, phenols, fuel oils, organic solvents.

- 5.4.37 The former AkzoNobel chemical works is described in more detail below.

Baseline Evolution

- 5.4.38 Immediately off-site to the north east is the former AkzoNobel chemical works which has been remediated as required by the local planning authority and as per the consented planning application reference 21/01146/FUL. The details of the remedial work are set out below.
- 5.4.39 According to information provided by RBC, the former AkzoNobel chemical works was remediated in 2008 to a standard deemed suitable for residential use as reported in a Remediation Statement by Arc Environmental Ltd (2021). It is understood that the remediation works have been accepted by RBC. The Remediation Statement states the following remedial work was carried out in 2008:
- Excavation of made ground to a minimum depth of 2m below finished remediation level.
 - Removal of structures to the base including relic foundations, slabs, service ducts with deeper structures such as piles being left in situ.
 - The segregation of significant contaminated soils and asbestos for further assessment and bio-physical treatment.
 - The process and screening of all excavation arisings to produce a suitable engineering fill for reuse in earthworks.
 - Remediation target values for soils placed between 800m and 1000m below ground level.
 - The placement of a 200mm thick (minimum) 'hard dig' layer below a minimum of 600mm clean capping material in gardens and areas of soft landscaping.
- 5.4.40 According to the Arc Environmental Remediation Statement, post-remediation works were required (as set out below); however, it is unclear whether the work has been undertaken to date:
- Suitable soils to be placed within Cells 4 and 6 (two areas in the north west of the former AkzoNobel site) to within 200mm of previous remediation level and capped with a hard-dig layer.
 - Placement of minimum 600mm "clean" capping soil capping layer above the hard-dig layer in all gardens / soft landscaped areas, using clean imported or approved site-won soils.
 - The construction of clean cover soil capping layer to be validated on completion physically on-site, and a programme of laboratory testing should be implemented to confirm chemical suitability.
 - Installation and verification of proprietary ground gas protection measures (Amber 1) in the proposed properties.
- 5.4.41 Post-remediation gas monitoring and more recent gas monitoring in 2022 recommended the NHBC risk derived classification for ground gases should be an 'Amber 1' classification (or a minimum of Characteristic Situation 2 or 'CS2') for the former AkzoNobel chemical works.
- 5.4.42 Under a no development scenario, and based on the completion of the remediation of the AkzoNobel chemical works, it is expected that the future baseline conditions at the

Hollingworth Road land parcel would remain largely the same as the current baseline. However, there is potential for contamination from the AkzoNobel chemical works to migrate onto the Hollingworth Road land parcel, for example through fibres and asbestos becoming airborne and the mobilisation of chemical contamination within the ground and groundwater entering the land parcel.

5.5 Primary and Tertiary Mitigation

Primary Mitigation

Construction

- 5.5.1 Primary mitigation during construction has not been identified with respect to ground conditions, land contamination and land stability hazards.

Operation

- 5.5.2 Primary mitigation during the operational phase includes the layout of the Proposed Development, which has been designed to avoid development on areas of the Hollingworth Road land parcel which have the potential to pose land stability hazards to sensitive receptors including human health (residential end users), controlled waters (the Rochdale Canal) and buildings/services (dwellings and infrastructure). In particular, these potential areas of the land parcel include the BGS recorded landslide in the north east and steeply sloping land in the central and north eastern area.

Tertiary Mitigation

Construction

- 5.5.3 Construction phase tertiary mitigation measures with respect to ground conditions, land contamination and land stability are set out below.
- 5.5.4 The Construction (Design & Management) Regulations (CDM 2015) are in place for managing the health, safety and welfare of construction projects and will apply to the Proposed Development. A Principal Designer and Principal Contractor will be appointed to plan, manage, monitor and coordinate health and safety during the pre-construction and construction phases respectively. The Principal Contractor will have responsibility for ensuring legislative compliance and obtaining all permits/licenses as required. Notably, the Principal Contractor will undertake a risk assessment to determine whether the works are required to comply with the Control of Asbestos Regulations 2012.
- 5.5.5 Site operatives will be required to wear appropriate personal protective clothing and equipment (PPE) at all times. During planned future intrusive investigations and construction work, the adoption of good standards of hygiene to prevent prolonged skin contact, inhalation and ingestion of soils during construction will be secured through the development and implementation of Risk Assessments and Method Statements (RAMS).
- 5.5.6 An Outline Construction Environmental Management Plan (CEMP) has been developed which sets out control measures to be implemented during construction to prevent minimise the adverse impact to the environment (including human health). The following control measures are of relevance to this ground conditions assessment:
- All operators carrying out excavation and other enabling works will be briefed on the contamination stop work procedure, whereby work will be stopped immediately if contamination is suspected during excavation. Operators will be made aware of the findings of the preliminary 2018 ground investigation, which encountered locally elevated concentrations of arsenic and lead in the centre of the Hollingworth Road

land parcel in the area of the farm and farm buildings and the presence of asbestos fibres and asbestos containing materials (ACMs) in the soils in the north of the land parcel adjacent to the former AkzoNobel chemical works. There is also potential for fibres and ACMs to be present in the area of the farm, farm buildings and suspected backfilled quarry adjacent to the farm. During the construction phase, if any unexpected contaminated soils are encountered during construction, they will be subject to a contamination risk assessment and will be managed in line with the soil management control measures set out in the CEMP.

- All staff/operators will be briefed on the specific emergency response procedure.
- All containers must be labelled and control of substances hazardous to health (COSHH) assessments will be readily available to all operators for use in the event of a spillage.
- The appropriate storage, transportation and handling of oils, fuels and other chemicals. Oils, fuels and other chemicals are to be located at least 10m distance from any watercourses and fuels will be stored in double skinned tanks or in tanks situate on bunds with secondary containment with a capacity of at least 110% of the largest tank. Valves, filters, sight gauges and vent pipes are to be situated within the secondary containment.
- The placement of static equipment on drip trays to prevent any leaking fuels, oils or chemicals from entering the soils and controlled waters.
- Refuelling of vehicles/equipment by competent persons and appropriately sized spill kits located at any sites where refuelling activities take place.
- Soil stockpiles will be sealed appropriately and located away from any watercourses and drains.
- Surface water drains will be protected with gully guards (or other appropriate products) during construction works and will be replaced when required.
- Soils will not be mixed with construction waste or contaminated materials.
- A Materials Management Plan (MMP) will be developed to manage arisings from excavations as per the CL:AIRE Code of Practice (CL:AIRE, 2011).

Operation

5.5.7 Operational phase tertiary mitigation measures have not been identified.

5.6 Assessment of Significant Likely Effects

5.6.1 The assessment of likely significant construction and operational phase effects below take into account the primary and tertiary mitigation identified above.

Construction

Human Health – Construction and Ground Workers

5.6.2 During the construction phase, ground workers and construction workers will be introduced as a new human health receptor. The primary hazard to ground and construction workers will be the potential short-term exposure to contamination in the soil, which is known to affect localised portions of the Hollingworth Road land parcel, namely the central and north eastern portions. Based on the findings of the desk based assessments and intrusive site

investigation, the potential presence of contamination at the land parcel is considered low for the majority of the land parcel in line with the previous and current land use, and moderate for the off-site former AkzoNobel chemical works to the north east and other industrial land uses off-site to the north west such as historical chemical works and railway land.

- 5.6.3 Construction and ground workers are considered to have a Medium sensitivity and the impact magnitude of exposure to contamination in the ground is considered to be Minor adverse which is assessed as a Slight adverse short-term effect and therefore Not Significant.

Human Health – Neighbouring Site Users (Residential)

- 5.6.4 Given the low contaminative potential of soils across the majority of the Hollingworth Road land parcel, the harmful exposure of contamination to the nearby residential users is considered unlikely during the construction phase.
- 5.6.5 Neighbouring residential users are considered to have a Very High sensitivity. The magnitude impact of contamination at the Hollingworth Road land parcel migrating off-site and affecting neighbouring human health receptors is considered to be Negligible which is assessed as a Slight short-term effect which is Not Significant.

Controlled Waters (Surface Water) and Ecological Receptors

- 5.6.6 Several surface water attenuation ponds are proposed across the Hollingworth Road land parcel in the north east, in the north west and through the centre of the land parcel. These attenuation ponds will drain to the Rochdale Canal, which has SSSI and SAC designations and therefore the sensitivity is considered to be Very High. At least one of the proposed attenuation ponds is located in an area where asbestos has been encountered during the Betts Geo GI and some of the proposed attenuation ponds are in locations where the ground conditions are unknown. Off-site, the Proposed Development is adjacent to several surface water features including the Rochdale Canal (which has an ecological SSSI and SAC designation) and the River Roch to the north, a reservoir to the east and Hollingworth Lake to the south.
- 5.6.7 There is potential for existing contamination at the Hollingworth Road land parcel to become mobilised during the construction phase and enter the surface water environment through surface water runoff or the various drains located across the land parcel; however, given the generally low contaminative potential of the land parcel, this is considered unlikely. There is potential for localised spillages of fuel, oils and chemicals, which may be led to contamination of the soils as well as being carried to surface watercourses.
- 5.6.8 The sensitivity of the off-site surface waters is considered to vary from Very High to Negligible and the magnitude impact of contamination from the Hollingworth Road land parcel entering the surface waters is considered to be Minor adverse. Once tertiary mitigation measures (namely the CEMP) are taken into account, the likely effect is considered to be a Slight to Negligible adverse short-term effect, which is Not Significant.

Controlled Waters – Groundwater

- 5.6.9 There is potential during the construction phase for contamination from leaks and spills of machinery or chemicals or for existing contamination in the soils to become mobilised during the earthworks. The likelihood of contamination entering the bedrock aquifer through migration and leaching is variable due to the low risk of contamination being present across the majority of the Hollingworth Road land parcel and the variability of the depth of the groundwater, which has been found as shallow in areas.

- 5.6.10 The superficial groundwaters beneath the land parcel are considered to have a Low sensitivity and the bedrock groundwater is considered to have a Medium sensitivity. The magnitude impact of existing contamination at the land parcel or pollution events (spills/leaks) entering the bedrock groundwaters is considered to be Minor adverse. Once tertiary migration is taken into account the effect is considered to be Slight adverse short-term, which is Not Significant.

Operation

Human Health – Future Site Users (Residential/School Users)

- 5.6.11 During the operational (completed development) phase, a new human health receptor will be introduced to the Hollingworth Road land parcel in the form of residents and users of the school. Contamination encountered in the ground during the GI has generally been very low with some localised contamination within the central and north-eastern parts of the land parcel. There are some gaps in the current dataset where areas of the land parcel have not been investigated including some areas along the boundary with the former AkzoNobel chemical works. Based on the GI undertaken previously, significant contamination is not considered to be present across most of the Hollingworth Road land parcel; however, there are still uncertainties about the ground conditions. Elevated concentrations of methane and carbon dioxide have been detected in the central and north-eastern parts of the land parcel, which requires further assessment. The current understanding is that mitigation will be required in the residential plot areas to mitigate risks to future end users.
- 5.6.12 Future site users are considered to have a Very High sensitivity, and the magnitude of the impact of contamination to affect the future users is Moderate to Negligible adverse given the gaps in the current ground conditions dataset. Once primary and tertiary migration is taken into account, the significance of effects is considered to be Large to Moderate, which is Significant.
- 5.6.13 The magnitude of the impact of ground gas affecting future end users is Moderate adverse. No primary or secondary mitigation has been identified with respect to ground gas, and so the significance of effects is considered to be Large, which is Significant.

Built Environment – Structures and Services

- 5.6.14 The Hollingworth Road land parcel is within an area of historical coal and non-coal mining/quarrying and a landslip has been recorded by the BGS in the north-western part of the land parcel; potential land stability risks have therefore been identified. Once tertiary mitigation is taken into account, the significance of effect is considered to be Negligible.

5.7 Secondary Mitigation and Enhancement

Construction and Operation

- 5.7.1 The following secondary mitigation measures during construction and operational have been identified:
- Given that the Hollingworth Road land parcel sits within an historical mining area, all site operatives should be made aware of the potential risk of unrecorded mine entries on-site and a watching brief should be maintained during site works.
 - Additional ground investigation and contamination risk assessment to remove the spatial gaps in the existing ground conditions dataset and to confirm the presence/absence of potential migratory contamination from adjacent former AkzoNobel chemical works. It would be prudent to carry out additional investigation

including soil and groundwater sampling in the north eastern part of the Hollingworth Road land parcel adjacent to the chemical works.

- Delineation and removal of the asbestos containing soils encountered in the north-eastern part of the Hollingworth Road land parcel in the area of the proposed attenuation basin.
- Further risk assessment of the elevated concentrations of arsenic and lead in the soils in the centre of the land parcel.
- The installation of additional ground gas monitoring wells where high concentrations of methane and carbon dioxide have been detected and further risk assessment to inform ground gas mitigation measures.
- If gas protection for buildings is considered necessary, the design of gas protection measures and the subsequent implementation of such a system including the verification and reporting of the installation of any gas protection measures, will be undertaken in accordance with the guidance given in BS 8485:2015+A1:2019.
- A risk assessment for water pipes will be undertaken to determine the appropriate type of pipework required for potable water supply.
- Where the attenuation pond is proposed in the north-eastern part of the Hollingworth Road land parcel (adjacent to the former AkzoNobel chemical works), it would be prudent to install basin liners in the construction of the basins to prevent the mixing of contamination that may be present in the soils with surface water in the attenuation basin. The need for basin liners will be informed by the additional ground investigation.
- Depending on the findings of the additional investigation and groundwater monitoring, a remediation strategy and subsequent validation report may be required.

5.8 Residual Effects

- 5.8.1 Once secondary mitigation is taken into account, all of the construction and operational phase effects are Negligible adverse, which is Not Significant.

5.9 Cumulative Effects

- 5.9.1 Four cumulative developments have been identified within 1km of the Hollingworth Road land parcel boundary; however, the former AkzoNobel chemical works site (21/01146/FUL) is not considered here for the reasons set out below.
- 5.9.2 Developments outside of 1km are outside of the ground conditions and contamination 'zone of influence' and are therefore scoped out of the cumulative effects assessment. Beyond 1 km, substantial variability in ground conditions, including hydrogeological conditions, land (and groundwater) contamination and ground instability are considered to result in negligible effects.
- 5.9.3 It is understood that the residential development of the former AkzoNobel chemical works has now commenced and therefore this development has been considered in the Baseline Evolution section and is not considered within the cumulative effects assessment.
- 5.9.4 Land to the west of New Street Littleborough (22/01039/FUL) is approximately 400m north west of the Hollingworth Road land parcel and has planning permission for the construction of a relatively small residential development (61 dwellings), open space, landscaping and sustainable urban drainage systems.

- 5.9.5 Land west of Smithy Bridge Road, Littleborough (22/01364/FUL) is approximately 700m to the north west and is awaiting a decision for a residential development (199 dwellings) including open space and associated infrastructure.
- 5.9.6 Land off New Road, Littleborough (20/00607/FUL) is approximately 200m to the north and is a residential development which is largely completed and occupied.
- 5.9.7 New/extended car parking at Rakewood Road is located approximately 185 m to the east of the Hollingworth Road land parcel.
- 5.9.8 The construction and operation of the proposed development will involve embedded mitigation measures. Furthermore, the Rochdale Canal creates a physical barrier, preventing cumulative effects of the proposed development to the north from occurring simultaneously. Based on this, it is anticipated that the cumulative effect of the proposed development and the above cumulative developments occurring simultaneously during the construction phase will be negligible and therefore not significant.

5.10 Monitoring

- 5.10.1 Monitoring requirements have been identified as secondary mitigation section. After secondary mitigation is taken into account, there are no significant residual effects and no monitoring requirements.

5.11 Consideration of Climate Change

- 5.11.1 There is currently significant research and development with respect to further understanding the impacts of future climate change on land contamination risk assessment (SoBRA, 2022). Of relevance to this chapter, modelling of the potential climate change impacts on the UK by the Met Office UK Climate Change Predictions (UKCP18, 2019) and the BGS (2017) is projecting the following:
- an increase in winter precipitation and a decrease in summer precipitation, with some spatial variation;
 - UK-wide warming with a greater summer warming than winter warming and the greater impacts in the south of the UK; and
 - A general increase in the recharge of groundwater bodies however this is restricted to shorter recharge windows in winter and potential greater spatial variability.
- 5.11.2 Of relevance to the Hollingworth Road land parcel, climate change has the potential to impact sensitive receptors at the land parcel in the following ways:
- Increased precipitation
 - increased precipitation has the potential to adversely impact the groundwater bodies beneath the land parcel through a projected increase in groundwater levels and potentially short-term groundwater flooding which may increase leaching and mobility of contaminants;
 - Extreme heat events
 - extreme heat events have the potential to cause land drying and cracking creating to vertical migration pathways (i.e. new pathways for the migration of ground gases in the central and north eastern parts of the Hollingworth Road land parcel);
 - cause groundwater levels to fall and change drainage patterns/increase overland flow.

5.12 Conclusions

- 5.12.1 The ground conditions and contamination chapter considers the impact of the Proposed Development on the ground conditions including hydrology and hydrogeology. A desk-based ground conditions assessment has been produced to inform this chapter. The guiding principles, as set out in the desk study, are the Environment Agency's Land Contamination Risk Management guidance, the Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance and the Environment Agency's approach to groundwater protection.
- 5.12.2 The primary sensitive receptors are considered to be human health (future end residential and school users) and controlled waters, predominantly the off-site Rochdale Canal and its ecological designations.
- 5.12.3 The Hollingworth Road land parcel is primarily used as agricultural land/disused land with Lower Cleggs Farm located in the centre of the land parcel. The land parcel has historically been used as agricultural land with some sandstone quarrying activities evident on historical mapping as well as records of coal mining beneath the land parcel. The published records from the British Geological Survey (BGS) show that superficial deposits (soils) are largely absent from the western part of the land parcel, with glacial Till deposits and Head deposits recorded in the eastern part of the land parcel.
- 5.12.4 The Pennine Lower Coal Measures Formation, the Milnrow Sandstone and the Darwen Flags are recorded beneath the Hollingworth Road land parcel. Two faults are mapped at the land parcel which are generally oriented north-west to south-east, with one fault passing through the central and another in the far eastern part of the land parcel. A BGS recorded landslip in the northern part of the land parcel and two faults are mapped generally oriented north-west to south-east, with one fault passing through the centre and another in the far eastern part of the land parcel.
- 5.12.5 A desk-based Coal Mining Risk Assessment, carried out in support of the planning application, concludes that risks to the Proposed Development from coal and non-coal mining are low and that no significant potential mining legacy issues have been identified, with a note that as the Hollingworth Road land parcel sits within a historical mining area, there is a residual risk of unrecorded mine entries to be present on-site.
- 5.12.6 Immediately off-site to the north east is the former AkzoNobel chemical works, which has been remediated as required by the local planning authority and as per the consented planning application. However, there still remains a risk of legacy migratory contamination from the chemical works in the north-western of the Hollingworth Road land parcel. A third party ground investigation was carried out in 2018 which encountered elevated metals and asbestos fibres in localised areas of the land parcel and elevated ground gas concentrations in the north-eastern part of the land parcel which required further investigation. Furthermore, spatial gaps in the ground characteristics dataset need to be removed by additional investigation.
- 5.12.7 Primary, secondary and tertiary mitigation measures have been identified including the CEMP, PPE and RAMS for construction works and additional investigation and risk assessment to remove the spatial gaps in the ground conditions dataset. Once mitigation measures are taken into consideration, the likely effects of the Proposed Development on ground conditions and contamination are reduced to Negligible.

5.13 References

- Betts Geo Environmental Ltd (2019) Bloor Homes Ground Investigation Report for Hollingworth Road, Littleborough, report reference: 18BLH008/GI.
- BGS (2023) GeoIndex Onshore online mapping, available at: <https://mapapps2.bgs.ac.uk/geoindex/home.html>, accessed: 10/10/2023.
- CL:AIRE (2011) The Definition of Waste: Development Industry Code of Practice Version 2. Contaminated Land: Applications in Real Environments, London.
- Coal Authority (2023) Interactive Map, available at: <https://mapapps2.bgs.ac.uk/coalauthority/home.html>, accessed: 06/10/2023.
- Department for Levelling Up, Housing and Communities (2023) National Planning Policy Framework, available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>, accessed: 06/10/2023.
- EA (2017) New groundwater vulnerability mapping methodology in England and Wales, Report – SC040016/R. Environment Agency, Bristol.
- EA (2018) The Environment Agency’s approach to groundwater protection [under review], last updated 02 October 2023. Environment Agency, Bristol.
- EA (2023) Land contamination risk management, last updated 20 July 2023, available at: [Land contamination risk management \(LCRM\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/land-contamination-risk-management), accessed: 06/10/2023.
- Highways England (2019) Design Manual for Roads and Bridges, Sustainability & Environment Appraisal, LA 109 Geology and soils, version 0 October 2019, available at: <https://www.standardsforhighways.co.uk/tses/attachments/adca4c7d-4037-4907-b633-76eaed30b9c0?inline=true>, accessed on 10/10/2023.
- Highways England (2020) Design Manual for Roads and Bridges, Sustainability & Environment Appraisal, LA 104 Environmental assessment and monitoring, available at: <https://www.standardsforhighways.co.uk/tses/attachments/0f6e0b6a-d08e-4673-8691-cab564d4a60a?inline=true>, accessed on 10/10/2023.
- Highways England (2020) Design Manual for Roads and Bridges, Sustainability & Environment Appraisal, LA 113 Road drainage and the water environment, version 1 March 2020, available at: <https://www.standardsforhighways.co.uk/tses/attachments/d6388f5f-2694-4986-ac46-b17b62c21727?inline=true>, accessed on 10/10/2023.
- Joint Nature Conservation Committee (2015) Rochdale Canal Designated Special Area of Conservation, available at: <https://sac.jncc.gov.uk/site/UK0030266>, accessed on 10/10/2023.
- Ministry of Housing, Communities & Local Government (2019) NPPF Planning practice guidance, available at: <https://www.gov.uk/government/collections/planning-practice-guidance>, accessed: 06/10/2023.
- Rochdale Borough Council (2016) Rochdale Adopted Core Strategy Adopted October 2016, available at: <https://www.rochdale.gov.uk/downloads/file/405/core-strategy>, accessed: 06/10/2023.

- Stantec UK Limited (2023) Hollingworth Road, Littleborough, Phase 1 Ground Condition Assessment (Desk Study), report reference: 332010570-STN-RP-3501-P00.
- Stantec UK Limited (2023) Hollingworth Road, Littleborough, Coal Mining Risk Assessment, report reference: 332010570-STN-RP-3501-R02-P00.
- Wardell Armstrong (2022) Bloor Homes North West Proposed Development at Land off Hollingworth Road, Smithy Bridge, Rochdale, Mineral Resource Assessment, job reference: ST29749.
- WSP (2006) AkzoNobel, Littleborough, Interpretative Report for AkzoNobel Chemicals Ltd, report reference 12121110/002/7320.

6 Historic Environment

6.1 Introduction

- 6.1.1 This chapter assesses the likely archaeological, built heritage and historic landscape and effects associated with the Proposed Development, and it sets out the relevant policies, proposed approach and methodology used within the Historic Environment Desk-based Assessment (hereafter HEDBA and archaeological geophysical survey).
- 6.1.2 The HEDBA was carried out by members of the Chartered Institute for Archaeologists (CIfA) at Stantec UK Limited. The authors of the chapter are registered with CIfA.
- 6.1.3 In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in **Volume 1: Appendix D**.

6.2 Policy Context, Legislation, Guidance and Standards

- 6.2.1 This section sets out the relevant legislation and policy that has been taken into account in the preparation of the assessment.

Legislation

- 6.2.2 The following legislation has informed the assessment:
- Ancient Monuments and Archaeological Areas Act 1979);
 - Planning (Listed Buildings and Conservation Areas) Act 1990; and
 - National Heritage Act 1983.

Policy

- 6.2.3 The following policy has informed the assessment:
- National Planning Policy Framework (NPPF) 2023: paras 194, 195, 199, 200, 201, 202, 203 and 205;
 - Rochdale Core Strategy (adopted October 2016): policy P2

Guidance

- 6.2.4 The assessment has been informed by the following guidance:
- Planning Practice Guidance (PPG) 2019: 'Historic Environment'
 - Chartered Institute for Archaeologists (CIfA) 'Standards and Guidance for Historic Environment Desk-based Assessment'
 - Design Manual for Roads and Bridges (DMRB) Environmental Assessment and Monitoring (LA 104)
 - DMRB Cultural Heritage Assessment (LA 106)

- Historic England (HE) 'Managing Significance in Decision-Taking in the Historic Environment'
- Historic England (HE) 'Statements of Heritage Significance: Analysing Significance in Heritage Assets'
- Institute for Environmental Management and Assessment (IEMA) 'Principals of Cultural Heritage Impact Assessment in the UK'

6.3 Consultation

- 6.3.1 The Screening Opinion (Ref: 19/00910/SO) made clear that Historic Environment should be 'scoped in' to the Environmental Statement (ES) referencing consultation responses from the Greater Manchester Archaeological Advisory Service (GMAAS) and the Council's Conservation Officer. The Scoping Opinion noted that GMAAS stated that: *"recent experience of large-scale housing developments within formerly undeveloped landscapes in Greater Manchester has highlighted how easily the archaeological interest can be damaged or destroyed through the prioritisation of other development-related activities such as building demolition, ground remediation and preparation before the archaeological heritage has been given due consideration. For this reason, and in accordance with National Planning Policy Framework (NPPF) 2019 paragraph 189, [now National Planning Policy Framework 2023 paragraph 194] GMAAS would anticipate that as part of an EIA the archaeological heritage being included within its scope in the form of a full desk-based assessment supported by the results of a geophysical survey evaluation."* The Scoping Opinion also noted that: *"there are no listed buildings located on the site itself and it is not designated as a conservation area, however the proposed development would be in the setting of some designated and non-designated heritage assets. Given the intervening distances between the site and these heritage assets it is expected that a heritage assessment, which will accompany the planning application, will conclude that the character and appearance, setting and features of special architectural or historic interest of the listed buildings would be preserved."*
- 6.3.2 As established within the HEDBA for the Hollingworth Road land parcel, there will be no direct impact upon the designated heritage assets of Rochdale Canal or Brown Bank Bridge. The Proposed Development will result in the loss of agricultural land historically associated with Brown Bank Bridge. Due to the topography of the landscape, any intervisibility between the proposed buildings and both structures (canal and bridge) will be slight and moreover the overall legibility of the historic landscape within their environs will be retained. As such, the Proposed Development will have no more than a negligible impact upon the heritage significance of Brown Bank Bridge, and an impact of no change upon the setting and heritage significance of Rochdale Canal.
- 6.3.3 The buildings planned by the Proposed Development within the Hollingworth Road land parcel are expected to share intervisibility with Birch Hill Clock Tower. However, as considered within the HEDBA for the Hollingworth Road land parcel, it is not considered that they will intercept any designed or key views and are at such a distance that they will result in only minor changes to its visual envelope. This will have an impact of no change upon the setting and heritage significance of Birch Hill Clock Tower.
- 6.3.4 As established within the HEDBA for the Rakewood Road land parcel, whilst there are several listed buildings and conservation areas within 1km of the Hollingworth Road land parcel, the Site does not currently contribute towards the significance of any designated heritage asset and the Proposed Development will not alter this.
- 6.3.5 The HEDBA for the Rakewood Road land parcel indicated that the Site has an unknown potential to contain prehistoric remains and an unknown potential to contain evidence of Romano-British to medieval activity. Remnants of post-medieval ridge and furrow earthworks may survive within the Site as buried remains, and there is a moderate potential

for further medieval to post-medieval agricultural deposits and features to be present. There is some potential that mining infrastructure could be present, although no mine shafts are presently recorded with the Site.

- 6.3.6 As such, given that no significant effects will occur as a consequence of the Proposed Development either in construction or operation, these assets are not considered further in the context of impact assessment.

6.4 Methodology

Study Area

- 6.4.1 A 1km Study Area around the operational boundary, as agreed with GMAAS and the Rochdale Conservation Officer, has been used to identify designated and non-designated heritage assets which might be affected by the Proposed Development and to inform the historic and archaeological background of this assessment. The assessment was informed by desk-based research (for both land parcels), a site visit carried out in November 2022 (for both land parcels) and geophysical survey of the Hollingworth Road land parcel undertaken in April 2023.

Baseline Data Collection

- 6.4.2 Two separate Historic Environment Desk-Based Assessments (HEDBA) were prepared in December 2022 (Stantec, 2022). The information provided in the HEDBAs has been used to inform this assessment (see **Appendix E.1** for full report).
- 6.4.3 The following sources were consulted to inform the presence of known heritage assets within the 1km Study Area:
- National Heritage List for England (NHLE) for designated heritage assets;
 - Greater Manchester Historic Environment Record (GMHER) for archaeological sites, events, findspots, historic buildings and historic landscape character (HLC) data;
 - Regional Archives for historic maps and manuscripts;
 - Groundsure for historic Ordnance Survey maps;
 - Historic England Archives for historic aerial photographs;
 - Aerial photographs from the Historic England Archives, held in Swindon;
 - Environment Agency LiDAR data; and
 - Relevant primary and secondary sources including published and unpublished reports relating to previous archaeological investigations and ground investigation works considered relevant.

Assessment

- 6.4.4 For the purpose of this chapter, the historic environment resource has been divided into three sub-topics which are defined as archaeological remains, historic buildings and historic landscapes.
- **Archaeological remains:** the material remains of human activity from the earliest periods of human evolution to the present. These could be buried traces of human activities, archaeological deposits, archaeological sites which are visible above

ground, or moveable artefacts. Archaeological remains can encompass the remains of buildings, structures, earthworks and landscapes, human, animal, or plant remains, or other organic material produced by or affected by human activities.

- **Historic buildings:** architectural, designed or other structures with a significant historical value. These could include structures that have no aesthetic appeal or structures not usually thought of as 'buildings', such as milestones or bridges.
- **Historic landscapes:** the current landscape, whose character is the consequence of the action and interaction of natural and/ or human factors.

6.4.5 The historic environment resource can be designated (heritage assets which are afforded statutory protection, such as listed buildings, scheduled monuments, and registered parks and gardens) or undesignated (heritage assets which have a degree of heritage value but do not meet the criteria for designation).

Value (sensitivity) of resource

6.4.6 The value (or sensitivity) of cultural heritage assets has been based mainly upon existing designations but allows for professional judgement where features are found which do not have any formal national or local designation. The value of cultural heritage assets is assessed on a five-point scale of, Very High, High, Medium, Low and Negligible. The criteria used to assess the value of cultural heritage assets is presented in Table 6.1. This is derived from Table 3.2N in DMRB (LA104) (Highways England, 2020) and incorporates more detailed descriptions used in the previous version of DMRB (HA208/07) (Highways Agency, 2007) specific to cultural heritage. Whilst the revised version of DMRB supersedes the previous version, the criteria tables used in the former version provide a greater level of detail specific to cultural heritage and have therefore been adopted in this assessment while continuing to adhere to the approach and guidance of the updated DMRB.

Table 6.1 Criteria for grading the value (or sensitivity) of cultural heritage assets

Value (sensitivity) of receptor/ resource	Typical description		
	Historic landscapes	Archaeological assets	Historic buildings
Very High (International)	World Heritage Sites inscribed for their historic landscape qualities Historic landscapes of international value, whether designated or not Extremely well-preserved historic landscapes with exceptional coherence, time depth or other critical factor(s)	World heritage sites Archaeological sites of acknowledged internal importance Assets that can contribute significantly to acknowledged international research objectives	Structures inscribed as being of universal importance as world heritage sites Other buildings recognised as internationally important
High (National)	Designated historic landscapes of outstanding interest Undesignated landscapes of outstanding interest Undesignated landscapes of high quality and importance and of demonstrable national value. Well preserved historic landscapes exhibiting considerable coherence, time-depth or other critical factors	Scheduled monuments (including proposed sites) Undesignated archaeological remains of schedulable quality and importance Assets that can contribute significantly to acknowledge national research objectives	Scheduled monuments with standing remains Grade I and II* listed buildings Other listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade

Value (sensitivity) of receptor/ resource	Typical description		
	Historic landscapes	Archaeological assets	Historic buildings
			Conservation areas containing very important buildings Undesignated structures of clear national importance
Medium (National/ regional)	Designated special historic landscapes. Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value. Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factors.	Archaeological remains that contribute towards regional research objectives	Grade II listed buildings Historic unlisted buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation areas containing buildings that contribute significantly to the historic character. Historic townscape or built-up areas with important historic integrity in their buildings or built settings (e.g. including street furniture and other structures).
Low (Regional/ local)	Robust undesignated historic landscapes. Historic landscapes with importance to local interest groups. Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.	Archaeological remains of local importance. Archaeological remains compromised by poor preservation and/or poor survival of contextual associations. Archaeological remains of limited value, but with potential to contribute to local research objectives	'Locally listed' buildings. Historic unlisted buildings of modest quality in their fabric or historical association. Historic townscape or built-up areas of limited historic integrity in their buildings or built settings (e.g. including street furniture and other structures).
Negligible (local)	Landscapes with little or no significant historical interest	Assets with very little or no surviving archaeological interest	Buildings with some hidden (i.e. inaccessible) potential for historic significance

Magnitude of impact

- 6.4.7 Magnitude of impact is the degree of change that would be experienced by a cultural heritage asset and its setting during the construction and operation of the Scheme, as compared with a 'do nothing' scenario. Magnitude of impact is assessed without reference to the value of the cultural heritage asset and could include physical impacts upon the cultural heritage asset or impacts on its setting. Effects may be temporary or permanent, direct or indirect and may be adverse, beneficial or may result in no change.
- 6.4.8 The magnitude of impact has been assessed using a five-point scale of, Major, Moderate, Minor, Negligible and No Change. The assessment is based on professional judgement and follows criteria provided in DMRB (LA 104) (Highways England, 2020). Factors in the assessment of the magnitude of impact for all cultural heritage assets are presented in Table 6.2.

Table 6.2 *Magnitude of impact and typical descriptions*

Magnitude of impact (change)		Typical description
Major	Adverse	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit Change to most or all key archaeological materials, such that the resource is totally altered. Comprehensive changes to setting. Change to key historic building elements, such that the resource is totally altered. Comprehensive changes to the setting.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Moderate	Adverse	Changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to historic landscape character. Changes to many key archaeological materials, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset. Change to many key historic building elements, such that the resource is significantly modified. Changes to the setting of an historic building, such that it is significantly modified.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Adverse	Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in limited changes to historic landscape character. Changes to key archaeological materials, such that the asset is slightly altered. Slight changes to setting. Change to key historic building elements, such that the asset is slightly different. Change to setting of an historic building, such that it is noticeably changed.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character. Very minor changes to archaeological materials or setting. Slight changes to historic buildings elements or setting that hardly affect it.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Significance of effect

6.4.9 For all three sub-topics the significance of effect has been determined as a combination of the assessment of the value of the historic environment asset and the magnitude of impact. This is achieved using professional judgement informed by the matrix illustrated below in Table 6.3. Five levels of significance (Substantial, Major, Moderate, Minor or Negligible/No Effect) are defined which apply equally to adverse and beneficial impacts. Where two significances of impacts are given in the table (for example neutral or slight) professional judgement is used in the text to suggest the most likely significance of effect in addition to the reasonable worst-case scenario.

6.4.10 A significance of effect of Moderate or above is taken to be significant in EIA terms.

Table 6.3 Significance of effect matrix

	Magnitude of impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
Environmental value (sensitivity)	Very High	Negligible or No Effect	Minor	Moderate or major	Major or substantial	Substantial
	High	Negligible or No Effect	Minor	Minor or moderate	Moderate or major	Major or substantial
	Medium	Negligible or No Effect	Negligible or minor	Minor	Moderate	Moderate or major
	Low	Negligible or No Effect	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Negligible	Negligible or No Effect	Negligible or No Effect	Neutral or slight	Negligible or minor	Minor

Limitations

6.4.11 Data used to compile this chapter consists of secondary information derived from a variety of sources. The assumption is made that this data, as well as that derived from other secondary sources, is reasonably accurate.

6.4.12 The records held by the GMHER are not a record of all surviving heritage assets, but a record of the discovery of a wide range of archaeological and historical components of the historic environment, usually driven by development in a particular area. The information held within it is not complete and does not preclude the subsequent discovery of further heritage assets that are, at present, unknown, notably buried archaeological remains.

6.5 Baseline Conditions

- 6.5.1 The baseline conditions here are derived from the historical and archaeological baseline provided in the associated HEDBAs, and covers archaeology, built heritage and the historic landscape (see Appendix E.1 for full report).

Designated Heritage Assets

- 6.5.2 Within the 1km Study Area there are 22 designated heritage assets including four conservation areas, two Grade II* listed buildings and 16 Grade II listed buildings. These are discussed fully in the appended HEDBAs.
- 6.5.3 The closest designated heritage asset is the Grade II listed Lodge Bridge (Bridge 53) (NHLE: 1068522) located across Rochdale Canal, c 180m west of the Hollingworth Road land parcel. There are a three further designated heritage assets within 500m of the Hollingworth Road land parcel. These include the Grade II listed 2 and 3 Wrigley Place (NHLE: 1309675) located within Smithy Bridge, c 370m to the west, and Hollingworth Fold Conservation Area and the Grade II listed Bear Hill on the western side of Hollingworth Lake, c 450m south-east of the Hollingworth Road land parcel.
- 6.5.4 Several listed buildings are located within and between Littleborough and Dearnley, within the northern part of the Study Area. These include the Grade II* listed Stubley Old Hall (NHLE: 1162360) c 515m north of the Hollingworth Road land parcel, and Dearnley Old Hall (NHLE: 1309691) c 815m north-west of the Hollingworth Road land parcel, in addition to 12 Grade II listed buildings located between c 580m and 970m north of the Hollingworth Road land parcel. The areas of Littleborough Town Centre c 600m north-east of the Hollingworth Road land parcel, and Birch Hill (also known as Dearnley Workhouse) c 800m north-west of the Hollingworth Road land parcel are also designated as conservation areas.
- 6.5.5 Within the southern part of the Study Area there is an additional Grade II listed building located with Hollingworth Fold (NHLE: 1162368) c 650m south-east of the Hollingworth Road land parcel, and areas of historic settlement are designated as conservation areas at Whittaker c 970m east of the Hollingworth Road land parcel, and Rakewood c 950m to the south.
- 6.5.6 There is intervisibility between the Hollingworth Road land parcel and Birch Hill Clock Tower, a component of the Dearnley Union workhouse, later Birch Hill Hospital, situated within Birch Hill Conservation Area. However, the building itself is not statutorily listed and there are no views (at ground level) between the conservation area and the land parcel. Accordingly, Birch Hill Conservation Area is not considered to have the potential to receive effects to its setting from the Proposed Development. Potential effects upon the Clock Tower will be considered independently, as a non-designated built heritage asset.
- 6.5.7 Despite the Hollingworth Road land parcel occupying a high point within the landscape it shares limited, if any, intervisibility with any of the other designated heritage assets, due to the intervening landscaping (vegetation, built environment and/or topography) or distance. There are also no apparent historic associations between the Hollingworth Road land parcel and any of the listed buildings or conservation areas. As such, no designated heritage assets are considered to have the potential to receive effects to their setting from the Proposed Development. Designated heritage assets have therefore been scoped out of this assessment and are not considered further.

Previous Archaeological Investigations

- 6.5.8 No previous archaeological investigations are recorded to have been conducted within the Hollingworth Road land parcel. Three intrusive archaeological investigations are recorded within the wider Study Area comprising a trial trench evaluation (HER: EGM5259) at

Dearnley Old Hall c 780m north-west of the Hollingworth Road land parcel, and an evaluation (HER: EGM5187) and watching brief (HER: EGM4954) at Hare Hill Mill c 900m north of the Hollingworth Road land parcel. Details regarding the structural sequencing of the historic mill buildings and buried structural remains indicative of potential earlier phases were recorded by the investigations at Hare Hill Mill; however, evidence recorded at Dearnley Old Hall was limited to poorly preserved remains of wall footings and a possible drain due to extensive disturbance.

Early Prehistoric Period (500,000 – 4,000 BC)

- 6.5.9 No Palaeolithic remains are recorded within the Study Area. The earliest evidence within the Study Area comprises Mesolithic flints (HER: 290.1.0) recovered from the area of Hollingworth Lake (a 19th-century reservoir) c 370m south of the Hollingworth Road land parcel. Significant environmental change took place during the Mesolithic period (10,000 BC - 4,000 BC) with open tundra-like habitats replaced by forested regions. During the later phases of the Mesolithic period much of Rochdale district would have been covered by deciduous forest, although from around 5,000 BC this began to decline and blanket peat started to develop (GMULC 2010). As a hunter-gather society resources would have been exploited seasonally during this period, with areas of occupation likely varying between lower altitudes in the winter to give maximum protection from weather conditions, with warmer weather and more abundant supplies permitting the occupation of higher altitudes and exposed hillsides (ibid).

Late Prehistoric Period (4,000 BC – AD 43)

- 6.5.10 Evidence of Neolithic activity recorded within the Study Area is also confined to residual finds, comprising flint implements (HER: 719.1.0) recovered from the area of Hollingworth Lake, c 460m south of the Hollingworth Road land parcel, and a late Neolithic polished stone axe-head (HER: 718.1.0) found in Hollingworth Fold, c 660m south-east of the Hollingworth Road land parcel. In general, the Neolithic period marks the development of more permanent settlements following the introduction of agriculture however, there is an absence of monuments and evidence of settlement activity within Rochdale district (GMULC 2010). There are no Bronze Age remains recorded within the Study Area, with evidence within the wider Rochdale district comprising a single occupation site and a number of barrows, as well as residual artefacts (ibid).
- 6.5.11 There are no Iron Age remains recorded within the Study Area, and this period within Rochdale district is represented by only a single find. It is suggested that much of the lowland evidence dating to this period has been destroyed by post-medieval and modern urban development, although upland area and less developed valleys could still reveal evidence of settlement (ibid). During the Iron Age Rochdale was controlled by the Brigantes, a large tribal group which controlled a large part of northern England up until AD 70, by which time it was under direct Roman control.

Romano-British Period (AD 43 – 410)

- 6.5.12 Evidence of Romano-British activity within the Study Area is represented by finds. An urn containing a number of Roman coins and a cup (HER: 733.1.0) was recovered during the excavation of foundations for Stubley Hall, c 450m north of the Hollingworth Road land parcel, whilst a hoard of 65 silver coins (HER: 8679.1.0) and a Bronze bracelet (HER: 8863.1.0) were identified by metal detecting around Hollingworth Brook, c 700m and 500m east of the Hollingworth Road land parcel respectively. The possible route of a Roman road, as indicated by the distribution of coin hoards, is also suggested as likely to extend through the Study Area, following the high ground to the north of the River Roch to the west of Littleborough (GMULC 2010).

Early Medieval (AD 410 – 1065)

- 6.5.13 The Hollingworth Road land parcel is located within the ancient township of Butterworth within Rochdale parish. The etymology of Butterworth is indicative of Saxon origin, derived from the Old English butere meaning butter and worð meaning an enclosure. The place name of Littleborough, is also derived from the Old English lytel and burh meaning 'little fort or stronghold' (Mills 2011, 300).
- 6.5.14 Despite the likely early-medieval origins of these areas of settlement, there is an absence of archaeological remains dating to this period recorded within the Study Area.

Later Medieval (AD 1066 – 1540)

- 6.5.15 The medieval manor of Cleggswood (HER: 2398.1.0), which formed part of the Butterworth township, was located c 165m east of the Hollingworth Road land parcel. The manor became the seat of the Belfields of Belfield at the beginning of the 16th-century (VCH 1911a) and at which time it is presumed that the house was established. Given its proximity to the manor, it is considered likely that the Hollingworth Road land parcel formed part of Cleggswood estate.
- 6.5.16 During the later medieval period Littleborough, which was located within the neighbouring township of Hundersfield, comprised a hamlet focused upon the junction of two ancient routes over the Pennines that converged to cross the River Roch. In 1471 the Abbot of Whalley granted a licence to the inhabitants of Butterworth and Hundersfield to erect a new chapel (HER: 2364.2.0) at Littleborough (GMULC 2010), which was located c 815m north-east of the Hollingworth Road land parcel in the vicinity of the existing church (HER: 2364.1.0). An inn is also recorded within Littleborough in 1472 and a water mill (HER: 2470.1.0), which is first mentioned in 1556, was located on the river, c 175m north of the Hollingworth Road land parcel. The Grade II* listed Stubley Hall (NHLE: 1162360) which stands to the east of Littleborough, is also of 15th-century origin.

Post-Medieval Period (AD 1540 – 1901)

- 6.5.17 Buildings within the vicinity of Lower Cleggswood Farm are first illustrated by maps of Lancashire from 1818 and 1829, although may have been present earlier. The 1829 map clearly shows Heald Lane (formerly Lower Cleggs Wood Lane) crossing through the centre of the Hollingworth Road land parcel as well as the route of a 'proposed road' crossing through the eastern part of the Hollingworth Road land parcel on a north-east, south-west alignment. The Hollingworth Road land parcel is not shown on Butterworth Tithe map (1846).
- 6.5.18 The 1851 OS map shows further buildings adjacent to Heald Lane, including at 'Heald' within the southern part of the Hollingworth Road land parcel, at 'Brown Bank Top' within the northern part of the Hollingworth Road land parcel, and a short distance east of the Hollingworth Road land parcel at 'Brown Bank'. Two wells are also illustrated at Heald and a spring is referred to in its vicinity on later mapping. By the 1891 OS map the number or size of the building/s at Heald Spring had been reduced. The buildings at Brown Bank Top are shown by the 1891 OS map to have comprised a row of four terraced cottages with several small outbuildings at either end. The Lower Cleggswood buildings, which remain largely extant, comprised a row of two cottages and an attached barn, and several outbuildings.
- 6.5.19 The 1851 OS map shows that land within the Hollingworth Road land parcel was enclosed by at least this time comprising a series of regular fields with straight boundaries defined by drystone walls, the majority of which survive in varying states of condition. Several trackways are also shown crossing the Hollingworth Road land parcel. Hollingworth Road had also been constructed by this time, albeit along the eastern side of the Hollingworth

Road land parcel rather than across it as indicated by the proposed alignment shown on the 1829 map.

- 6.5.20 A sandstone quarry, one of a number within the area, is shown within the north-western part of the Hollingworth Road land parcel on the 1851 Ordnance Survey map and by the time of the 1891 OS map is referred to as an 'old quarry'. This quarry site and another area of likely 19th-century quarrying within the Hollingworth Road land parcel, adjacent to the reservoir, are identifiable as earthworks. An 'old coal pit' is also shown a short distance north of the Hollingworth Road land parcel on the 1851 OS map and another disused mine shaft is shown on the 1909 OS map directly adjacent to the north-western corner of the Hollingworth Road land parcel. Mining of coal seam beneath the Hollingworth Road land parcel are recorded to have taken place within the Hollingworth Road land parcel during the 19th-century (Coal Authority 2021), presumably in association with the 'Clough Fields' mine, shown on 19th- to 20th-century OS maps c 200m north-east of the Hollingworth Road land parcel. Clough Fields is one of several mines located within the area including Cleggswood Colliery (HER: 8848.1.0/8848.1.1) which opened in 1818, c 500m north-east of the Hollingworth Road land parcel, and Cleggswood New/Wheelbarrow Mine which had opened by 1893, c 300m north-east of the Hollingworth Road land parcel. The 'Clough Field Works' and 'Cleggswood Works' (later 'Cleggswood Oil Distillery') had also been established c 50m north of the Hollingworth Road land parcel by the end of the 19th-century.
- 6.5.21 In 1794 an Act of Parliament sanctioned the construction of the Rochdale Canal. The canal extends for 51km across the Pennine between Manchester and Sowerbridge, passing directly north of the Hollingworth Road land parcel. The canal was opened in sections however, it formally opened in 1804. Hollingworth Lake, directly south of the Hollingworth Road land parcel, was created as feeder source for the canal and was completed in 1800. A 'drain or conduit' connecting the canal and the lake, is shown to have extended through the eastern part of the Hollingworth Road land parcel by the 1851 OS map. A discrete earthwork is present along the line of this drain, which is indicated by modern plans to survive as a below-ground pipeline. The small reservoir directly east of the Hollingworth Road land parcel was established by 1892. Brown Bank Bridge (Bridge 52) crosses over the canal at the end of Heald Lane, adjacent to the northern corner of the Hollingworth Road land parcel. Another similar bridge, the Grade II listed Lodge Bridge (Bridge 53), crosses the canal further to the west.
- 6.5.22 Littleborough witnessed significant linear growth, primarily to the north of the River Roch, during the 19th-century, influenced initially by the construction of the Rochdale Canal and later by the Manchester and Leeds railway line, which opened in 1841, crossing through the Study Area c 25m north of the Hollingworth Road land parcel. Many of the post-medieval monuments recorded within the northern part of the Study Area also relate to industrial activity, including further collieries, brickworks and mills, whilst remains within the southern part of the Study Area are primarily characterised by isolated farmstead settlements.

Modern (1901 – Present)

- 6.5.23 20th-century OS maps show that a small 'Water Meter House' was constructed within the Hollingworth Road land parcel, adjacent to the southern boundary, between 1910 and 1928 within an enclosed field/area. The building at Heald Spring appears to have been demolished by 1949, and the Brown Bank Top cottages were demolished between 1954 and 1968. During the walkover survey the structural remains of an earlier building were observed below the existing (modern) structures at Heald Spring. Remains of the Brown Bank Top cottages were also observed in the form of a mounded earthwork representing the overgrown foundations and/or demolition rubble. What appears to be 'robber pit' has been excavated within earthwork to extract the underlying stonework.

- 6.5.24 A large ovate feature is also shown to the north of Lower Cleggswood Farm complex on the 1968 OS map. The feature is consistent with an area of disturbance evident on LiDAR data and is thought to represent a possible quarry site. The carpark within the south-western corner of the Hollingworth Road land parcel was established between 1976 and 1989.
- 6.5.25 The Rochdale Canal was in decline by the 1920s and in 1923 Hollingworth Lake was sold to local authorities for use as a public water supply. Most of the length of the canal was closed in 1952; however, a programme of restoration throughout the later 20th-century resulted in the canal being reopened for navigation along its entire length in 2002.
- 6.5.26 There was significant development within Littleborough during the later 20th-century. The Cleggswood Oil Distillery and Clough Field Works complex expanded further to the west between 1954 and 1968 and by 1976 had expanded up to the northern boundary of the Hollingworth Road land parcel. There was also significant development within Smithy Bridge and Hollingworth from the mid-20th-century and by 1976 residential development also directly bordered the Hollingworth Road land parcel to the south-west. The Cleggswood Oil Distillery/Clough Field Works is no longer shown on the 2010 OS map, presumed to have been demolished in 2009-10.

Undated

- 6.5.27 Broad linear earthworks are present on the north facing slope of the hillside within the north-western part of the Hollingworth Road land parcel. These east-west aligned earthworks may represent ridge and furrow earthworks of medieval to post-medieval date or strip lynchets of potentially earlier origin. However, it is also possible that they represent modern terracing as linear scars consistent with the features are apparent on 1946 aerial photographs (Ref: RAF/3G/TUD/UK/188-5249). More definitive remnants of medieval to post-medieval ridge and furrow survive as east-west aligned earthworks within the eastern part of the Hollingworth Road land parcel.
- 6.5.28 A substantial ovate feature is cut into the hillside in the northern part of the Hollingworth Road land parcel. This feature is thought to represent a 'borrow pit', excavated to provide material for the construction of a nearby infrastructure project. Aerial photographs show that the feature was excavated prior to 1946, and it is therefore possible that it may have been associated with the construction of the railway embankment c 25m north of the Hollingworth Road land parcel, although its exact origin is not known. The slopes of the pit appear terraced. It is considered that this is most likely to have been deliberately established to limit erosion/landslide, although it does also share characteristics with 'desire lines' formed by grazing livestock on hillsides.

LiDAR & Aerial Photographs

- 6.5.29 LiDAR data and aerial photographs illustrate the extent of area of historic quarrying within the Hollingworth Road land parcel. This includes the aforementioned 'old quarry', first shown on mid-19th-century mapping, situated within the north-western part of the Hollingworth Road land parcel, as well as other areas of likely quarrying activity (not shown on historic mapping) in the eastern part of the Hollingworth Road land parcel, directly adjacent to the reservoir and on the western side of Heald Lane, to the north of Lower Cleggswood Farm. The borrow pit within the northern part of the Hollingworth Road land parcel, is also very distinguishable on LiDAR data.
- 6.5.30 An aforementioned linear feature, representing the line of a drain/conduit between Rochdale Canal and Hollingworth Reservoir as shown on the 1851 OS map, is identifiable on LiDAR data. Another linear feature is identifiable toward the centre of the Hollingworth Road land parcel, between the reservoir and Lower Cleggswood Farm. This feature is also clearly distinguishable on 1995 aerial photographs (Ref: OS/95533), curving around to the

east toward the southern end of the reservoir. Given this, it is considered that this feature represents a former channel or rivulet.

- 6.5.31 The aforementioned linear earthworks present within the north-western part of the Hollingworth Road land parcel are identifiable on both LiDAR and aerial photographs, and remnants of ridge and furrow earthworks (Plate 11) within the eastern part of the Hollingworth Road land parcel are also identifiable on the LiDAR data.
- 6.5.32 Features and areas of disturbances are evident at the former sites of buildings at Brown Bank Top and Heald Spring. Other potential features or areas of disturbance are also identifiable within the Hollingworth Road land parcel adjacent to Heald Lane and to the south of the reservoir. It is unclear to what these may relate and therefore it is possible they may also be of historic origin. Areas of disturbance relating to modern activities are apparent within the vicinity of the carpark and Lower Cleggswood Farm.

Baseline Evolution

- 6.5.33 The nature of any archaeological remains within the Hollingworth Road land parcel is unknown at this moment in time. Therefore, the future baseline has the potential to change if archaeological remains are found within the land parcel and/or wider study area during the course of other development projects or archaeological investigations. The incremental nature of the expansion of archaeological knowledge by investigations within the wider study area will cause a gradual evolution of the future baseline as more data becomes available.
- 6.5.34 In the absence of the Proposed Development there will be no change to the historic landscape character.

6.6 Primary and Tertiary Mitigation

- 6.6.1 This section sets out mitigation that is embedded into the design of the Proposed Development and is relevant to the assessment of effects in relation to the historic environment. This includes primary mitigation (design features) and tertiary mitigation (standard actions that will be undertaken to meet other existing legislative requirements or are considered to be standard practices used to manage commonly occurring environmental effects).

Primary Mitigation

Construction

- 6.6.2 The building height parameters are such that any consequentially limit the height and intensity of use of any construction-related structures required for the works (e.g. cranes).

Operation

- 6.6.3 The building height parameters are such that intervisibility and change to the wider historic environment will not be a significant change.

Tertiary Mitigation

Construction

- 6.6.4 Good construction practice measures such as vehicle wheel washing to mitigate dust soiling effects on the setting of built heritage assets will be implemented by the CEMP which will be secured by planning condition.

Operation

- 6.6.5 There are no tertiary mitigation measures in relation to the operation phase.

6.7 Assessment of Significant Likely Effects

- 6.7.1 This section presents the assessment of likely significant effects for construction and operation on cultural heritage receptors. The assessment of effects takes into account the potential impacts to each receptor following the implementation of embedded and essential mitigation measures to determine the significance of the residual effects.

6.8 Secondary Mitigation and Enhancement

Construction – Archaeology

- 6.8.1 During the construction of the Proposed Development groundworks associated with the new buildings as well as landscaping, access, tree planting and excavation for new services and attenuation ponds will have a direct effect on any archaeological remains within the footprint of these intrusive groundworks. The remains could be significantly damaged or destroyed which represents an impact of major magnitude upon any archaeological remains, the presence and significance of which is currently unknown.
- 6.8.2 It is considered that any remains would most likely be of low value and therefore an impact of major magnitude would result in a minor/moderate adverse effect (significant) before additional mitigation. The effect upon any as yet unknown archaeological remains would be permanent and irreversible.
- 6.8.3 A programme of archaeological investigation has been required by GMAAS in order to mitigate the potential damage or loss of archaeological deposits, the presence and therefore extent of which are as yet unknown. This will consist in the first instance of evaluation trenching within the areas of proposed ground disturbance.
- 6.8.4 These evaluative investigations will provide information on the presence of buried archaeological deposits surviving within the Hollingworth Road land parcel, their nature and extent, and will inform the requirement for further archaeological work (mitigation). The scale and scope of this mitigation will be agreed with GMAAS and would offset or reduce any potential significant effects upon archaeology. While the precise nature of mitigation is at this stage unknown it is likely to take the form of archaeological strip, map and sample, watching brief and/or area excavation, targeting specific sections of the Hollingworth Road land parcel as identified by the evaluation trenching. This further mitigation will serve to preserve any archaeological deposits by record.

Construction – Historic landscape

- 6.8.5 The historic landscape comprises evidence of medieval/post medieval field systems that contribute towards the wider agricultural setting of some of the non-designated heritage assets found in proximity to the Hollingworth Road land parcel which are considered to be of low value. The construction phase of the Proposed Development will result in a direct impact, and the permanent loss of agricultural use and character. As this class of landscape is well represented, in greater levels of preservation, elsewhere locally, regionally and nationally, minor adverse effects are anticipated that are not believed to be material to the decision-making process.
- 6.8.6 Mitigation of this impact would form part of the objective of the archaeological fieldwork outlined in "Construction – Archaeology".

Construction – Built Heritage

- 6.8.7 During the construction of the Proposed Development, it is understood that all extant buildings will be removed. The core of Lower Cleggswood Farm and the cohort of dry stone walls within the development boundary are considered to be non-designated heritage assets, and as such their entire loss will represent an impact of major magnitude.
- 6.8.8 Both Lower Cleggswood Farm and the dry stone walls are of low heritage value and therefore an impact of major magnitude would result in a minor/moderate adverse effect (significant) before additional mitigation. The effect would be permanent and irreversible.
- 6.8.9 It is proposed that a programme of building recording should be undertaken prior to the demolition of Lower Cleggswood Farm and the dry stone walls. The scale and scope of this recording will be agreed with GMAAS and the Conservation Officer for RBC and would offset or reduce any potential significant effects.

Operation

- 6.8.10 There will be no direct or indirect effects upon any as yet unknown archaeological remains within the Hollingworth Road land parcel during the operational phase. Any such remains within the Proposed Development's footprint will have been lost or removed during the construction phase.
- 6.8.11 The Proposed Development will have no direct or indirect effects upon designated heritage assets during the operational phase. There are no indicators of any intangible connections which would be changed by the Proposed Development during operation.
- 6.8.12 There will be no direct effects upon the Hollingworth Road land parcel's historic landscape character during the operational phase. Any impacts will have occurred during the construction phase.

6.9 Residual Effects

- 6.9.1 This section presents the residual effects following the implementation of the additional mitigation.
- 6.9.2 Any archaeological remains present within the footprint of the Proposed Development have the potential to be damaged during the construction phase unless preserved in situ. Where the remains of very high value are encountered these are likely to be preserved in situ so there will be an effect of no change to the receptor. For remains of low to medium value, where preservation in situ is not needed, the mitigation measures detailed above will fully record any remains present thus ensuring their preservation by record.
- 6.9.3 As a result of the proposed mitigation, the residual effect upon any archaeological remains during construction is likely to be a permanent, irreversible minor adverse effect (depending on the value of the receptors), which is not considered to be significant.
- 6.9.4 No adverse effects are anticipated upon any historic environment receptors during the operation of the Proposed Development and, as such, there will be a neutral residual effect.
- 6.9.5 No mitigation is required for the Hollingworth Road land parcel's historic landscape character and therefore the assessment of likely effects presented above identifies the residual and non-significant effects on the historic landscape during both construction and operation.
- 6.9.6 Outside of these specifics, no other heritage assets will be significantly affected during the construction phase.

6.10 Cumulative Effects

6.10.1 **Please refer to Volume 1: Chapter 10 for the cumulative effects assessment for both the Hollingworth Road land parcel and Rakewood Road lan parcel.Monitoring**

6.10.2 No significant adverse effects are expected following mitigation.

6.11 Consideration of Climate Change

6.11.1 Based on UKCP18 climate projections, it is expected that the Proposed Development will experience warmer, drier summers and milder, wetter winters, along with an increase in frequency and intensity of extreme weather events (heatwaves, droughts etc.). This has the potential to adversely affect receptors within the proposed development.

6.11.2 In the case of the Hollingworth Road land parcel, specific changes include the following:

- Landscapes – generally increased temperatures may result in a rise in invasive species (flora and fauna) which could change the character of the historic landscape present. In the case of the land parcel, this is not considered to represent a significant impact given that the current use represents managed agriculture which, in of itself, would limit this change.
- Buildings – generally warmer/wetter conditions could lead to increased fungal/plant growth or insect infestation within or upon historic building materials. Extreme temperature conditions may also increase the possibility of structural problems. The former is not considered to represent a significant impact given that the structures present within the land parcel itself (in terms of material usage) are unlikely to be destabilised significantly through biological impact. With respect to the latter point, general changes to the stability of the geology would represent a wider risk to the stability of the buildings but would not represent a significant impact that could not be addressed through gradual maintenance.
- Archaeology – Primary concerns to buried archaeological deposits relate to specific classes of assets which are susceptible to changes in soil saturation and shrinkage, changes to soil chemistry, and indirect effects like stratigraphic alteration. Specifically, wetland sites (with organic materials in anaerobic conditions) are at great risk, but general cycles of expansion/contraction, or cycles of wetter/dryer soil conditions will have an underlying deleterious impact on archaeological assets. In respect to the Hollingworth Road land parcel, these impacts are not expected to be significant in of themselves given the classes of asset known to be present (i.e. not relating to organic materials) and also that the archaeological remains are at equal or greater risk from ongoing agricultural land management (surface or deep ploughing).

6.12 Conclusions

6.12.1 This assessment has addressed the content of Section 16 of the NPPF and Policy P2 of the Rochdale Core Strategy in providing an assessment of known and potential heritage assets within the Hollingworth Road land parcel area and a surrounding study area.

6.12.2 Lower Cleggswood Farm, as an example of an early 19th-century farmstead, is of local (low) heritage significance. Numerous drystone walls surviving within the land parcel are also of local (low) heritage significance and form an important component part of the wider historic landscape. While the land parcel is considered to form part of the visual setting of several other non-designated heritage assets including the Rochdale Canal, Brown Bank Bridge and Birch Hill Clock Tower building, the level of change (in both construction and operation) has been determined as not significant.

- 6.12.3 Intrusive groundworks associated with the Proposed Development will adversely impact (damage or remove) any archaeological deposits present within their footprint. The GMAAS requires that an archaeological evaluation be conducted across the Hollingworth Road land parcel to establish the archaeological potential and the significance of any archaeological remains present. Appropriate evaluative works will comprise a programme of geophysical survey (as detailed herein in relation to the Hollingworth Road land parcel) followed by targeted trial trench evaluation (which will be completed post-determination). The exact trial trench evaluation scope will be subject to agreement with GMAAS. The results of the evaluation will inform the requirement and scope of archaeological mitigation.
- 6.12.4 Lower Cleggswood Farm and drystone walls within the Hollingworth Road land parcel, both of which have or include components of historic value, will be demolished under the Proposed Development. It is therefore anticipated that a programme of historic building recording will be required prior to demolition of these structures. Given the (low/local) heritage significance of these assets, it is considered that a Historic England Level 1 Survey (Historic England 2016) would be appropriate but this would be subject to agreement with the Rochdale Conservation Officer.
- 6.12.5 The Proposed Development will have no more than a negligible indirect impact upon the heritage significance of any other non-designated heritage asset and an overall minor permanent effect upon the significance of the historic landscape. The Proposed Development will not impact upon any designated heritage asset (or their setting).
- 6.12.6 Based upon existing evidence, there is nothing to indicate that there will be any archaeological remains of designable (national) heritage significance present within the Hollingworth Road land parcel. This assessment has identified that the Hollingworth Road land parcel contains, and has the potential to contain further, as yet unknown, archaeological remains. As such, the direction of assessment has addressed the desire of the Rochdale Core Strategy plan (Policy P2) to seek protection and enhancement of heritage assets against Paragraph 203 of the NPPF (2023) which states, '*in weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset*'. In this instance, it is believed that the loss of the known and potential archaeological and built heritage resource as a result of the Proposed Scheme can be mitigated through a proportionate programme of archaeological work that has been agreed with GMAAS.

6.13 References

- Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2019) *Planning Policy Guidance – Historic environment*. Available at <https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment>
- Greater Manchester Urban Historic Landscape Characterisation (GMUHLC) (2010) *Greater Manchester Urban Historic Landscape Characterisation - Rochdale District Report*.
- Historic England (2016) *Understanding Historic Buildings – A Guide to Good Recording Practice*. Available at: <https://historicengland.org.uk/images-books/publications/understanding-historic-buildings/heag099-understanding-historic-buildings/>
- Historic England (2017) *The Setting of Heritage Assets*. Historic Environment Good Practice Advice in Planning Note 3 (Second Edition). Available at <https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/>

- Historic England (2019) *Statements of Heritage Significance: Analysing Significance in Heritage Assets*. Historic England Advice Note 12. Available at <https://historicengland.org.uk/images-books/publications/statements-heritage-significance-advice-note-12/>
- Ministry of Housing Communities and Local Government (2023) *National Planning Policy Framework*. Available at <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- Stantec (2022) *Hollingworth Road, Littleborough - Historic Environment Desk-Based Assessment*
- Stantec (2023) *Hollingworth Lake Visitor Car Park, Littleborough - Historic Environment Desk-Based Assessment*
- Victoria County History (VCH) ed. W.Farrer and J. Brownbill (1911a) Townships: Butterworth in *A History of the County of Lancaster*, Volume 5: London. Available at: British History Online <http://www.british-history.ac.uk/vch/lancs/vol5/pp213-222> [accessed 18 October 2022].
- Victoria County History (VCH) ed. W.Farrer and J. Brownbill (1911b) The parish of Rochdale in *A History of the County of Lancaster*, Volume 5: London. Available at: British History Online <http://www.british-history.ac.uk/vch/lancs/vol5/pp187-201> [accessed October 2022].
- WYAS Archaeological Services (2023) *Hollingworth Road, Littleborough, Greater Manchester. Geophysical Survey*

7 Traffic and Transport

7.1 Introduction

- 7.1.1 This chapter assesses the likely traffic and transport effects associated with the proposed development. It considers the relevant policies, proposed approach and methodology.
- 7.1.2 The chapter has been prepared by Curtins. The report author is Alex Vogt, who is a Board Director at Curtins with over 22 years' experience in development planning.
- 7.1.3 In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in Volume 1: Appendix D.
- 7.1.4 The chapter should be read alongside the accompanying documentation supporting the planning application:
- **Transport Assessment**, document reference 079716-CUR-XX-XX-T-TP-00001.
 - **Framework Travel Plan**, document reference 079716-CUR-XX-XX-T-TP-00002.

7.2 Policy Context, Legislation, Guidance and Standards

- 7.2.1 This chapter has been produced with consideration given to relevant local and national planning policy.

National Planning Policy

- 7.2.2 Section 9 of the National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities (DLUHC), 2023) is entitled 'Promoting Sustainable Transport' and outlines the important role that transport policies have to play in facilitating sustainable development. The section states that:

"The planning system should actively manage patterns of growth ... Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes."

- 7.2.3 Paragraph 115 of the NPPF states 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."

- 7.2.4 The Planning Practice Guidance (PPG) document (DLUHC, last updated 2023), which sits alongside the NPPF, contains a specific section that clarifies the over-arching principles on Travel Plans, Transport Assessments and Transport Statements.
- 7.2.5 The guidance on Transport Assessments and Transport Statements re-iterates the circumstances in which either document would usually be required. It also clarifies the process for establishing a scope for what the documents should contain.
- 7.2.6 Reporting of the Proposed Development accords with the principles of the NPPF and the PPG. This position is discussed further throughout the accompanying **Transport Assessment (Appendix 13.2)**.

Local Planning Policy

- 7.2.7 In January 2021, Transport for Greater Manchester (TfGM) published a 2040 Vision for Transport to develop flexible and customer-focused travel choices, supported by smart information, ticketing and payment systems, across a truly integrated Greater Manchester transport network. The Transport Strategy states an ambition for a well-connected, zero carbon Regional Centre at the heart of the North.
- 7.2.8 One of the main outcomes of the Transport Strategy is bus franchising. Buses are now part of an integrated public transport network, known as the 'Bee Network', which allows people to change between different modes of transport with price capped tickets. In the new system, Greater Manchester Combined Authority (GMCA) coordinates the bus network and contracts bus companies to run the services. Around half of buses in Greater Manchester have joined the Bee Network – including services in Rochdale. By January 2025, all Greater Manchester buses will be under local control, which would benefit future residents of the proposed development.
- 7.2.9 Additionally, the Rochdale Core Strategy (October 2016) promotes similar principles to the NPPF. It sets out the long-term spatial strategy for future development in Rochdale until 2028.
- 7.2.10 The transport-related policies within the Core Strategy are as follows:
- Policy C3 – Delivering the Right Type of Housing;
 - Policy T1 – Delivering Sustainable Transport; and
 - Policy T2 – Improving Accessibility.
- 7.2.11 The Hollingworth Road land parcel is allocated by the adopted Places for Everyone (PfE) Plan for a residential development of around 300 homes (Policy JP Allocation 20: Land North of Smithy Bridge). PfE details various requirements in relation to development at Allocation 20, including the necessary and supporting transport interventions.
- 7.2.12 The transport-related policies within PfE are as follows:
- Policy JP-C1 – An Integrated Network;
 - Policy JP-C3 – Public Transport;
 - Policy JP-C5 – Streets for All;
 - Policy JP-C6 – Walking and Cycling; and
 - Policy JP-C8 – Transport Requirements of New Development.

7.3 Consultation

Table 7.1 Summary of Consultation

Consultation	Summary of issues raised during consultation	How it has been dealt within this chapter	Where it has been addressed within the chapter
RBC (Planning) 31/07/2019	Request for EIA Screening Opinion The Council's Highways Section did not raise any highway safety concerns subject to a number of measures: ▪ submission of a Transport Assessment; and ▪ provision of multiple access points to the Hollingworth Road land parcel to ensure the land parcel meets the requirements of the Emergency Services.	A Transport Assessment has been prepared to form part of the planning application.	Transport Assessment
RBC (Highways) 06/09/2021	Curtins agreed on a scope of assessment for a Transport Assessment. The agreed parameters relevant to the ES include: ▪ Methodology for trip generation and distribution; ▪ No traffic growth to be applied to future years (consideration of committed developments is sufficient in establishing a future year scenario); and ▪ A list of junctions to be assessed.	The agreed parameters have formed the basis of baseline data and future year scenarios.	Methodology
RBC (Highways) and TfGM 28/02/2023	The mitigation schemes that had been prepared by RBC for 2 key junctions (A58 / Canal Street and Kiln Lane / Wildhouse Lane) were discussed. It was agreed that if third party land was required to deliver a scheme, RBC would lead on this and any developer would be expected to provide a contribution. The results of the Transport Assessment would inform this approach. A 50-50 north / south split for development traffic was agreed, and it was agreed that queues observed at junctions would be added onto peak hour traffic flows to account for demand. Mitigation measures such as connecting footways within the Hollingworth Road land parcel to the canal and onwards to the rail stations, and bus service enhancement, were discussed.	The agreed parameters have formed the basis of future year scenarios. Curtins and Bloor are awaiting feedback from RBC Highways and TfGM in order to progress the mitigation strategy.	Primary and Tertiary Mitigation
RBC (Planning and Highways) 29/01/2024	Further details on mitigation were discussed, noting that this could take the form of a S106 contribution with precise details to be agreed at a later date. If an appropriate contribution was agreed between the parties, it was agreed that there would be no restriction on the full development coming forward and responsibility for the delivery of the mitigation would sit with RBC Highways. It was also agreed that the southern access junction would need to comprise a carriageway width of 6.75m but could reduce to 5.5m once past the proposed school.	The approach to mitigation has been streamlined with the junction capacity assessments presented in the Transport Assessment supporting the planning application.	Primary and Tertiary Mitigation

7.4 Methodology

Study Area

7.4.1 Curtins undertook scoping discussions with RBC Highways on 6th September 2021. During those discussions, it was agreed that modelling of the existing operation (baseline data) and with development operation, using traditional standalone junction modelling packages, should be undertaken at the following junctions:

- Site Access 1 – Southern site access off B6225 Hollingworth Road;
- Site Access 2 – Northern site access off B6225 Hollingworth Road;
- Junction 1 – A58 Halifax Road / Wardle Road roundabout;
- Junction 2 – A58 Halifax Road / Birch Road / Old Road signalised junction;
- Junction 3 – A58 Halifax Road / Union Road / Smithy Bridge Road signalised junction;
- Junction 4 – Smithy Bridge Road / B6225 Milnrow Road roundabout;
- Junction 5 – B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction;
- Junction 6 – B6225 Lake Bank / Rakewood Road / Hollingworth Road junction;
- Junction 7 – A58 Halifax Road / A6033 Todmorden Road signalised junction;
- Junction 8 – A58 Halifax Road / Canal Street junction;
- Junction 9 – A640 Rochdale Road / B6225 Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction;
- Junction 10 – B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout; and
- Junction 11 – B6225 Wildhouse Lane / Kiln Lane junction.

7.4.2 The study area also includes each link which forms each of the junctions listed above (for example, for Junction 1 – A58 Halifax Road / Wardle Road roundabout, the study area includes the Wardle Road arm of the junction, and both the western and eastern arms of the A58 Halifax Road).

Baseline Data Collection

- 7.4.3 Full turning movement surveys at the 11 junctions noted above were undertaken by an independent traffic survey company on Thursday 28th April 2022 between 07:00-09:00 and 15:00-18:00, and Saturday 30th April 2022 between 11:00-15:00.
- 7.4.4 As requested by TfGM, the baseline peak hour flows include queues at the end of the peak hour that have been added to signalised junctions (Junctions 2, 3, 7, and 9).
- 7.4.5 An Automatic Traffic Counter (ATC) was also installed along the B6225 Hollingworth Road (in the vicinity of the proposed site junctions) to capture vehicle flow and speeds.
- 7.4.6 As the site access junctions currently do not exist, data from the ATC was utilised to understand the baseline traffic flow along the B6225 Hollingworth Road.

Assessment

- 7.4.7 The recent publication of the Institute of Environmental Management and Assessment (IEMA) guideline, titled 'Environmental Assessment of Traffic and Movement' (IEMA, July 2023), provides an update to the 'Guidelines for the Environmental Assessment of Road Traffic' published in 1993.
- 7.4.8 The recently published 2023 guidance replaces the 1993 guidance by way of an update rather than an overhaul. Much of the sentiment within the 1993 guidance is retained. As noted within its executive summary, the 2023 publication seeks to bring the IEMA's advice up-to-date based on lessons learned since 1993:

"These updated and replacement Guidelines on the Environmental Assessment of Traffic and Movement bring IEMA's advice up to date based on the lessons learned over the past 30 years of impact assessment practice in the field, and provide the basis for a systematic, consistent and comprehensive coverage for the assessment of traffic and movement impacts for a wide range of development projects."

- 7.4.9 It is considered that one of the primary ways this will be achieved is by placing additional emphasis on professional judgement:

"These updated and replacement Guidelines are intended to complement professional judgement and the experience of trained and competent assessors. As the environmental impact of traffic and movement will vary on a case-by-case basis, the experience and expertise of the assessor will remain of primary importance, along with adequate consultation."

- 7.4.10 The principles established within the 2023 IEMA Guidance have been adopted throughout the production of this chapter.

Identification of Receptors

- 7.4.11 The IEMA Guidance notes the importance of identifying particular population groups that may be sensitive to changes in traffic conditions. The following user groups are outlined at paragraph 1.28 of the IEMA Guidance:
- *"Non-motorised users"*
 - *Public right of way users*
 - *Motorists and freight vehicles*
 - *Public transport*
 - *Emergency services"*
- 7.4.12 At paragraph 1.30, the IEMA Guidance outlines the following groups and special interests which could be affected by the proposed development and therefore may be considered receptors:
- *"People at home"*
 - *People at work*
 - *Sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors)*

- *Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools)*
- *Retail areas*
- *Recreational areas*
- *Tourist attractions*
- *Collision clusters and routes with road safety concerns*
- *Junctions and highway links at (or over) capacity*

Assessment Categories

- The 2023 guidance provides amended assessment categories as follows. These categories are discussed within the subsequent corresponding subheadings, and will be adopted as the assessment categories throughout this document:
- *“Severance of communities;*
- *Road vehicle driver and passenger delay;*
- *Non-motorised user delay;*
- *Non-motorised amenity;*
- *Fear and intimidation on and by road users;*
- *Road user and pedestrian safety; and*
- *Hazardous/large loads”*

Severance of Communities

7.4.13 Severance is a perceived division that occurs when a traffic link separates part of an existing community. This can occur when a road becomes too heavily trafficked (making crossing the road a problem) or when a new route divides existing land creating a physical barrier.

7.4.14 IEMA Guidance recognise that measuring and predicting severance can be difficult. At paragraph 3.16, the IEMA Guidance states:

“The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively...However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic.”

7.4.15 This assessment will adopt these 30%, 60% and 90% indicators cautiously whilst applying professional judgment in consideration of how road width, traffic flow and composition, traffic speeds, the availability of crossing facilities and the anticipated number of movements influences severance.

Road Vehicle Driver and Passenger Delay

7.4.16 Road vehicle driver and passenger delay is the time lost to a specific journey as a result of other users on a given network. As a development generates vehicular trips and as they are distributed onto the surrounding road network, they impact the operation of that network. Impacts on the surrounding road network can manifest in additional delay and / or queuing for drivers and their passengers and public transport users where applicable.

7.4.17 At paragraph 3.20, the IEMA Guidance states:

“These delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. Values for delay due to these elements can be determined by the use of proprietary software packages such as Transport Research Laboratory’s Junctions 10 suite (e.g. ARCADY for roundabouts, PICADY for priority junctions and OSCADY for traffic signalised intersections), JCT’s LinSig or other suitable programs...”

7.4.18 Curtins has agreed a scope of assessment with RBC Highways. The Transport Assessment accompanying this planning application uses Junctions 9 and LinSig modelling packages to measure any impacts on queuing and delay. This assessment will summarise these modelling results and provide an overview of any development impacts.

Non-motorised User Delay

7.4.19 Non-motorised user delay is the time lost to a specific journey as a result of other users on a given network. As a development generates vehicular trips, the vehicular demand affects the ability of users to cross local routes, which results in an impact on delay. Impacts on the surrounding road network can manifest in additional delay for pedestrians, runners, cyclists and equestrians where applicable.

7.4.20 The IEMA Guidance recognises that non-motorised user delay is closely related to severance. At paragraph 3.26, the IEMA Guidance states:

“Given the range of local factors and conditions that can influence pedestrian delay (e.g. a discrete delay may have a lesser impact in an urban environment than a rural setting), it is not considered wise to set down definitive thresholds. Instead it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect.”

7.4.21 This assessment will exercise professional judgement in consideration of baseline conditions, the anticipated vehicle and non-motorised user demand, and any embedded or proposed mitigation that influences vehicle and non-motorised user journeys.

Non-motorised Amenity

7.4.22 Non-motorised amenity is the relative pleasantness of a journey as a result of other users on a given network. Influencing factors can be traffic flow, traffic composition and separation from traffic.

7.4.23 The IEMA Guidance recognises that fear and intimidation fall under the category of non-motorised amenity, but that such an impact warrants its own category. At paragraph 3.30, the IEMA Guidance states:

“The 1993 Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or HGV component) is halved or doubled...Thresholds are expressed as a starting point for any assessment and typically have been derived from studies of major changes in traffic flow and

therefore should be used cautiously in any assessment. The assessment of amenity should pay full regard to specific local conditions.”

- 7.4.24 This assessment will adopt the positive / negative 50% indicators cautiously whilst applying professional judgment in consideration of the anticipated vehicle and non-motorised user demand, and any proposed or embedded mitigation that influences vehicle and non-motorised user journeys.

Fear and Intimidation on and by Road Users

- 7.4.25 Fear and intimidation can also change as a result of changes in baseline traffic flows. This is influenced by a number of factors including the volume of traffic, Heavy Goods Vehicle (HGV) content, nature and frequency of pedestrian / cycle / equestrian infrastructure, and the width of such infrastructure.
- 7.4.26 The IEMA Guidance recognises an absence of commonly agreed thresholds. However, a suggested methodology for calculating fear and intimidation is set out in Tables 3.1, 3.2, 3.3 and the associated text of the IEMA Guidance. **Table 7.2** below sets out the initial degree of hazard scoring:

Table 7.2 Fear and Intimidation Degree of Hazard

Average traffic flow over 18-hour day – all vehicles / hour 2-way (a)	Total 18-hour heavy vehicle flow (b)	Average Vehicle Speed in mph (c)	Degree of Hazard Score
>1,800	>3,000	>40	30
1,200 – 1,800	2,000 – 3,000	30 – 40	20
600 – 1,200	1,000 – 2,000	20 – 30	10
<600	<1,000	<20	0

- 7.4.27 A baseline level of fear and intimidation is derived by combining the ‘Degree of Hazard’ scores for the above columns a, b, and c. The resulting calculation will categorise the existing level of fear and intimidation on the link as follows:

- Extreme: 71+;
- Great: 41–70;
- Moderate: 21–40; and
- Small: 0–20.

- 7.4.28 This assessment will then exercise professional judgement in consideration of baseline conditions, any step change to the above level of fear and intimidation categories, and any embedded or proposed mitigation that influences vehicle and non-motorised user journeys.

Road User and Pedestrian Safety

- 7.4.29 Road user and pedestrian safety is concerned with current and future collision rates, with a particular emphasis on serious and fatal collisions. The IEMA Guidance notes that, whilst collision cluster analysis is still relevant, the ‘Safe System’ should be adopted as an international best practice. This involves:

- Identifying the study area using historic crash data;
- Undertaking evidence-led, objective modelling techniques to establish a baseline road safety level for the roads within the study area; and
- Assessing the effects of additional development traffic for all users.

7.4.30 At paragraph 3.46, the IEMA Guidance states:

“The final impact assessment should present calculated changes in levels of the roads’ intrinsic safety.”

7.4.31 Analysis based on data from the TfGM Road Accidents database has already been undertaken within the Transport Assessment accompanying this planning application. This assessment uses the iRAP Demonstrator tool to calculate the safety of links before and after the proposed development where appropriate. Outputs will be in iRAP Stars Ratings.

Hazardous / Large Loads

7.4.32 Given the Proposed Development is largely residential in nature, the movement of hazardous loads is not necessary during either the construction or operational phases. It is therefore appropriate to remove further consideration of hazardous loads from this chapter.

7.4.33 Given the Proposed Development is primarily residential in nature, the movement of large / abnormal loads is also not necessary during the operational phase. Given the Proposed Development does not yet have any planning approval and as there is currently no appointed contractor, there is no certainty over the type of construction vehicles or equipment that will need access at any construction phase.

7.4.34 Should the Proposed Development receive planning permission, however, it is considered that a typical pre-commencement planning condition would be to secure a Construction Environment Management Plan (CEMP). At the time of writing, an Outline CEMP has been prepared by RSK, which will be submitted as part of the planning application.

7.4.35 The Outline CEMP document has been produced in consultation with the appointed contractor, RBC Highways and National Highways (as the regulator of the movement of large / abnormal loads), and will require formal comments by RBC as the Local Planning Authority. It is therefore appropriate to remove further consideration of large loads from this chapter.

Calculating Potential Effects

Sensitivity of Receptors

7.4.36 The sensitivity of receptors will be taken into consideration when determining the overall significance of the effects. The categories used are shown in **Table 7.3** below, as derived from the IEMA Guidance. In order to provide a robust assessment, all receptors are considered to be of ‘High’ sensitivity:

Table 7.3 Matrix of Sensitivity of Receptors for the Consideration of Environmental Effects

Sensitivity of Receptor		
High	Moderate	Low
People at home. People at work. Sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors). Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools). Retail areas. Recreational areas. Tourist attractions. Collision clusters and routes with road safety concerns. Junctions and highway links at (or over) capacity.	None	None

7.4.37 In consideration of the IEMA Guidance, and as there is significant cross-over between the receptors listed above, the receptors referred to throughout this chapter have been simplified to cover all those who use the highway affected by the proposed development, specifically:

- Pedestrians;
- Cyclists;
- Equestrians;
- Public transport users; and
- Motorists.

Assessment Thresholds

7.4.38 The 2023 IEMA Guidance retains the long-established (since 1993) broad assessment thresholds as follows:

“Following the determination of a study area, it is recommended the competent traffic and movement expert applies two broad rules of thumb as criteria to assist in delimiting the scale and extent of the environmental assessment:

Rule 1 – Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%).

Rule 2 – Include highway links of high sensitivity where traffic flows have increased by 10% or more.”

7.4.39 This assessment will exercise professional judgement in consideration of the above 30% and 10% thresholds; appreciating that the prevailing baseline conditions and receptors on certain links may influence the appropriateness of an assessment of that link.

7.4.40 Full explanations will be given in this chapter if links within the 30% threshold are included or if links in excess of the 30% threshold are excluded from the assessment.

Magnitude of Potential Impacts

7.4.41 The magnitude of potential effects (both beneficial and adverse) on environmental baseline conditions will be identified through the detailed consideration of the proposed development, taking into account the following:

- The degree to which the environment is potentially affected – for example, whether the quality is enhanced or impaired;
- The scale or degree of change from baseline conditions as a result of the proposed development;
- The duration of the effect, for example, whether it is temporary or permanent; and
- The reversibility of the effect.

7.4.42 The scale / magnitude of effects will be assessed for the construction and operational phases using the following indicative criteria which have been established with reference to the IEMA Guidance alongside professional experience and judgement. The assessment criteria are described in **Table 7.4**:

Table 7.4 Magnitude of Impacts

Magnitude of Impact	Effect on	Definition of Magnitude
Major	Severance of communities	Over 90% change to baseline traffic flows, in conjunction with professional judgement concluding a fundamental change from baseline conditions.
	Road vehicle driver and passenger delay	Anticipated delay and/or queuing post-development is fundamentally changed from baseline conditions in a way that is also perceptible to drivers/passengers.
	Non-motorised user delay	Professional judgement, including consideration of anticipated impacts on severance, concludes a fundamental change from baseline conditions.
	Non-motorised amenity	Over 50% change to baseline traffic flows or HGV percentage, in conjunction with professional judgement concluding a fundamental change from baseline conditions.
	Fear and intimidation on and by road users	Anticipated step change in level of fear and intimidation is two or more levels, in conjunction with professional judgement concluding a fundamental change from baseline conditions.
	Road user and pedestrian safety	Anticipated step change in two or more iRAP Star Ratings, in conjunction with professional judgement concluding a fundamental change from baseline conditions.
Moderate	Severance of communities	Over 60% change to baseline traffic flows, in conjunction with professional judgement concluding a material change from baseline conditions.
	Road vehicle driver and passenger delay	Anticipated delay and/or queuing post Development is materially changed from baseline conditions in a way that is also perceptible to drivers/ passengers.
	Non-motorised user delay	Professional judgement, including consideration of anticipated impacts on severance, concludes a material change from baseline conditions.

Magnitude of Impact	Effect on	Definition of Magnitude
	Non-motorised amenity	25 – 50% change to baseline traffic flows or HGV percentage, in conjunction with professional judgement concluding a material change from baseline conditions.
	Fear and intimidation on and by road users	Anticipated step change in level of fear and intimidation is one or more levels, in conjunction with professional judgement concluding a material change from baseline conditions.
	Road user and pedestrian safety	Anticipated step change in one or more iRAP Star Ratings, in conjunction with professional judgement concluding a material change from baseline conditions.
Minor	Severance of communities	Over 30% change to baseline traffic flows, in conjunction with professional judgement concluding a discernible change from baseline conditions.
	Road vehicle driver and passenger delay	Anticipated delay and/or queuing post-development is discernibly changed from baseline conditions in a way that is also perceptible to drivers/ passengers.
	Non-motorised user delay	Professional judgement, including consideration of anticipated impacts on severance, concludes a discernible change from baseline conditions.
	Non-motorised amenity	10 – 25% change to baseline traffic flows or HGV percentage, in conjunction with professional judgement concluding a discernible change from baseline conditions.
	Fear and intimidation on and by road users	Anticipated step change in level of fear and intimidation is one or more levels, in conjunction with professional judgement concluding a discernible change from baseline conditions.
	Road user and pedestrian safety	Anticipated step change in one or more iRAP Star Ratings, in conjunction with professional judgement concluding a discernible change from baseline conditions.
Negligible	Severance of communities	0 – 25% change to baseline traffic flows, in conjunction with professional judgement concluding a barely distinguishable change from baseline conditions.
	Road vehicle driver and passenger delay	Anticipated delay and/or queuing post-development is barely distinguishable from baseline conditions in a way that is also not perceptible to drivers/passengers.
	Non-motorised user delay	Professional judgement, including consideration of anticipated impacts on severance, concludes a barely distinguishable change from baseline conditions.
	Non-motorised amenity	0 – 10% change to baseline traffic flows or HGV percentage, in conjunction with professional judgement concluding a barely distinguishable change from baseline conditions.
	Fear and intimidation on and by road users	No anticipated step change in level of fear and intimidation, in conjunction with professional judgement concluding a barely distinguishable change from baseline conditions.
	Road user and pedestrian safety	No anticipated step change in iRAP Star Ratings, in conjunction with professional judgement concluding a barely distinguishable change from baseline conditions.

Significance of Effects

- 7.4.43 The significance of the transport and access effects, adverse or beneficial, will be determined based on their magnitude and the sensitivity of the receptor. The receptor will be considered to be all road users, such as pedestrians, cyclists, public transport users, and motorists.
- 7.4.44 The significance of change in traffic flow volume on road users for each of the environmental effects will be considered in relation to the significance matrix in **Table 7.5**.

Table 7.5 Matrix of Significance for the Consideration of Environmental Effects

Magnitude of Change	Sensitivity of Receptor		
	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 – Negligible
Negligible	Negligible	Negligible	Negligible

- 7.4.45 Within the assessment, the level of magnitude will be defined on the basis of relevant guidance and the application of standard transport planning practice. Considering the table above the following terms will be used to assess the significance of environmental effects:
- Major adverse or beneficial effect – where the proposed development would cause a significant improvement or deterioration to the receptor;
 - Moderate adverse or beneficial effect – where the proposed development would cause a noticeable improvement or deterioration to the receptor;
 - Minor adverse or beneficial effect – where the proposed development would cause a barely noticeable improvement or deterioration to the receptor; and
 - Negligible effect – where the proposed development would cause no noticeable improvement or deterioration to the receptor.
- 7.4.46 Any effect of 'Moderate' or 'Major' will be considered as significant. This chapter will reflect the findings of the Transport Assessment supporting this planning application, whilst assigning levels of significance to the assessed effects. The chapter will set out the requisite mitigation measures and the residual effects once these are incorporated into the Proposed Development.

Duration of the Effect

- 7.4.47 Any effects associated with the construction period are deemed temporary. Any effects associated with the operational period are considered permanent.

Limitations

- 7.4.48 All traffic flows have been taken from data provided by an independent survey company. Curtins assumes the accuracy of these vehicle flows.

- 7.4.49 Curtins has derived the development flows following a TRICS assessment and using Census Journey to Work statistics for traffic distribution. These are all forecasted flows, and therefore are subject to limitations. The full details of these calculations are provided within the accompanying Transport Assessment.
- 7.4.50 Capacity assessments have been undertaken using the industry-standard junction modelling software packages LinSig and Junctions 9 programmes, more details of which are provided within the accompanying Transport Assessment. These programmes are an accurate reflection of junction capacities when used appropriately, but there are various assumptions included within each model.
- 7.4.51 Annual Average Daily Traffic (AADT) flows have been derived from a combination of obtained 24-hour ATCs and calculated from peak hour flows. These calculations are therefore forecasts, and there are both limitations and assumptions associated with factoring traffic counts from peak hours to 24-hour AADT flows.

7.5 Baseline Conditions

The Hollingworth Road land parcel

- 7.5.1 The Hollingworth Road land parcel is described in detail in Volume 1: **Chapter 2** of the ES.

The Surrounding Area

Surrounding Highway Network

B6225 Hollingworth Road / Lake Bank / Smithy Bridge Road

- 7.5.2 The B6225 Hollingworth Road forms the eastern boundary of the Hollingworth Road land parcel. The southern section of the B6225 is bordered by residential properties on the eastern side and the Hollingworth Lake car park on the western side.
- 7.5.3 The B6225 Lake Bank forms the southern boundary of the land parcel. The road is bordered to the south by the lake, the activity centre, and The Beach public house. Further to the west, the road is bordered by a combination of residential properties and retail, food and beverage (F&B), and leisure uses.
- 7.5.4 The B6225 Smithy Bridge Road extends from its junction with Lake Bank in a northerly direction towards the A58. The road is largely bordered by residential properties on both sides, with some retail and commercial uses. Smithy Bridge rail station is located halfway between the A58 and Hollingworth Lake, and there is a level crossing across Smithy Bridge at this point. The crossing is controlled by automatic barriers.
- 7.5.5 All of the above roads have a speed limit of 30mph, and as such there is street lighting for their entire length. There are also 2m-wide footways on both sides of the carriageway. In some areas, there are grass verges between the highway and the footway, or the footway is partially segregated from the road at a different level.
- 7.5.6 On-site observations during the traditional peak periods demonstrated that the roads do not appear to suffer from congestion. However, some queuing and delay was observed where the roads meet the A58, and during off-peak periods and weekends when the lake and surrounding uses are busy.

B6225 Milnrow Road / Wildhouse Lane

- 7.5.7 Milnrow Road extends away from Smithy Bridge Road and Hollingworth Lake in a southerly direction towards Milnrow. Much of the B6225 in this area is bordered by agricultural land

and as such the speed limit for part of the road (between Smithy Bridge and Milnrow) is 50mph, otherwise the speed limit within the village centres is 30mph. There is a continuous 2m-wide footway on the western side of the carriageway.

- 7.5.8 On-site observations during the peak periods indicate some queuing and delay at the northernmost and southernmost junctions. The route can also become busy during off-peak periods as it provides a primary route to Hollingworth Lake from the motorway.

A58

- 7.5.9 The A58 Halifax Road is located to the north of the Hollingworth Road land parcel. It is a main distributor road of strategic importance which forms part of the national Primary Route Network and the Greater Manchester Key Route Network. Nonetheless, in the vicinity of the Hollingworth Road land parcel, the A58 also plays a local role and accommodates multiple priority junctions to access residential roads.
- 7.5.10 On-site observations during peak and off-peak periods have indicated queuing and delay at some junctions.

Accessibility by Sustainable Modes of Transport

- 7.5.11 Whilst the immediate surrounds of the Proposed Development are semi-rural in nature, there are many Public Rights of Way (PRoW) around the Hollingworth Road land parcel. A PRoW (reference number: 424) defines the boundary between the Proposed Development and the neighbouring former Akzo Nobel site (now controlled by Vistry Partnerships) to the north, with access also proposed from the B6225 Hollingworth Road. On-site observations have shown that the Vistry site is separated from the Proposed Development by a fence.
- 7.5.12 The Vistry Partnerships planning application was submitted in 2021 (RBC planning reference: 21/01146/FUL) with the following development description, and was granted planning permission in April 2023:

“Residential development - erection of up to 127 residential dwellings including new vehicular access points, footpaths, cycle paths, boundaries, landscaping, creation of open space, a pumping station and other associated works | Former Akzo Nobel Site, Hollingworth Road, Littleborough”

- 7.5.13 At the northern boundary of the Hollingworth Road land parcel, the PRoW continues as a bridge across the Rochdale Canal, leading towards a public footpath / cycle path along the canal, leading towards Littleborough station to the north and Smithy Bridge to the south. Furthermore, as discussed later in this chapter, a series of pedestrian enhancements are to be brought forward (such as enhancements of the existing PRoW across the land parcel) which will enhance the connectivity of the Proposed Development.
- 7.5.14 In light of the above, it can be said that the Hollingworth Road land parcel is located close to existing facilities and is suitably accessible for pedestrians. Given the pre-existing residential areas to the south and west of the Hollingworth Road land parcel, there are established pedestrian links along the main carriageway which benefit from well-maintained footways, with suitable widths, and crossing facilities complete with dropped kerbs.
- 7.5.15 Facilities in the vicinity of Hollingworth Lake are within walking a 500m walking distance of the centre of the land parcel. This includes a number of local amenities such as public houses, restaurants, hot food takeaways and small retail opportunities. All of those facilities are accessible via the network of existing PRoW across the land parcel.
- 7.5.16 The land parcel is located broadly equidistant from the Littleborough and Smithy Bridge rail stations, both of which are within 1-1.2km walking distance. This distance is outside of the

preferred distance to the nearest rail station; however, this can still be considered an acceptable walk for many residents and one that many people are willing to do.

- 7.5.17 Further afield, all of Littleborough, Smithy Bridge and parts of the A58 corridor are within an acceptable walking distance. These areas include the Smithy Bridge and Littleborough rail stations, which would provide access to future residents requiring to commute for work, leisure, or other purposes. The Hollingworth Road land parcel is roughly equidistant between the two rail stations.
- 7.5.18 There are no segregated cycle facilities within the immediate vicinity of the land parcel, with cyclists expected to travel on-carriageway with general traffic. However, there is a traffic-free route just to the north of the land parcel where National Cycle Network (NCN) Route 66 links Littleborough with Rochdale and West Yorkshire following the Rochdale Canal towpath.
- 7.5.19 The nearest bus stops are located on the B6225 Hollingworth Road to the east of the land parcel and within 400m walking distance. Additional services are accessible from bus stops along Smithy Bridge Road and the A58, some 1km to the west and north respectively. This provides access to areas such as Rochdale town centre, Halifax town centre, and Milnrow.
- 7.5.20 As outlined above, the Hollingworth Road land parcel is located within walking distance of the Littleborough and Smithy Bridge rail stations. Trains run every 30 minutes between Leeds and Manchester Victoria, and hourly between Blackburn and Manchester Victoria.
- 7.5.21 In summary, the Hollingworth Road land parcel is located such as to benefit from existing walking, cycling, and public transport opportunities.

Baseline Traffic Data Calculations

- 7.5.22 The following **Table 7.6** provides Baseline (2022) 24-hour and 18-hour 2-way AADT flows for the assessment scope:

Table 7.6 Baseline (2022) Traffic Flows

Junction		Link		2022 Baseline 2-way AADT Flows (Vehicles)	
				24hr	18hr
SA1	Site Access (Southern)	a	B6225 Hollingworth Road (N)	11,818	11,509
		b	Site Access (S)	0	0
		c	B6225 Hollingworth Road (S)	11,818	11,509
SA2	Site Access (Northern)	a	B6225 Hollingworth Road (N)	11,818	11,509
		b	Site Access (S)	0	0
		c	B6225 Hollingworth Road (S)	11,818	11,509
1	A58 Halifax Road / Wardle Road roundabout	a	Wardle Road	9,126	8,887
		b	A58 Halifax Road (E)	23,570	22,954
		c	A58 Halifax Road (W)	31,065	30,253
2	A58 Halifax Road / Birch Road / Old Road signalised junction	a	Birch Road	11,549	11,247
		b	A58 Halifax Road (E)	24,815	24,166
		c	Old Road	170	166
		d	A58 Halifax Road (W)	22,948	22,348

Junction		Link		2022 Baseline 2-way AADT Flows (Vehicles)	
				24hr	18hr
3	A58 Halifax Road / Smithy Bridge Road signalised junction	a	A58 Halifax Road (E)	19,961	19,439
		b	Smithy Bridge Road	9,381	9,136
		c	A58 Halifax Road (W)	24,599	23,956
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	13,443	13,091
		b	B6225 Milnrow Road	16,705	16,268
		c	Smithy Bridge Road (W)	8,975	8,740
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	13,161	12,817
		b	The Beach Car Park	216	211
		c	Smithy Bridge Road (E)	170	166
		d	Milbury Drive	341	332
		e	B6225 Smithy Bridge Road (W)	13,181	12,836
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	12,709	12,377
		b	The Wine Press Car Park	144	140
		c	Rakewood Road	970	944
		d	B6225 Lake Bank	13,023	12,683
7	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A6033 Todmorden Road	13,829	13,468
		b	A58 Halifax Road (E)	15,506	15,101
		c	A58 Halifax Road (W)	13,299	12,951
8	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A58 Halifax Road (E)	7,147	6,960
		b	Canal Street	12,539	12,211
		c	A58 Halifax Road (W)	15,506	15,101
9	A640 Rochdale Road / B6225 Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction	a	A640 Rochdale Road	18,664	18,176
		b	B6225 Bridge Street	20,400	19,866
		c	A640 Elizabethan Way	20,210	19,681
		d	Wesley Street	13	13
10	B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout	a	B6225 Kiln Lane	19,633	19,120
		b	Dale Street	12,984	12,645
		c	B6225 Bridge Street	12,948	19,426
11	B6225 Wildhouse Lane / Kiln Lane junction	a	B6225 Wildhouse Lane	15,788	15,375
		b	Kiln Lane (E)	5,038	4,906
		c	B6225 Kiln Lane (W)	16,685	16,249

Baseline Highway Safety Calculations

TfGM Accident Data Analysis

- 7.5.23 Personal Injury Accident (PIA) data for the highway network adjacent to the Hollingworth Road land parcel has been obtained from the TfGM Road Accidents database for the most recent 60 months, as presented within the accompanying Transport Assessment. The full Highway Safety assessment is provided within the accompanying Transport Assessment; however the assessment concludes:

“This review does not highlight any clusters of collisions which would warrant further investigation, and there are no concentrations of vehicle collisions or irregular casualties that would suggest an existing safety issue that would be exacerbated by the proposed development. This is a view that was shared by Officers at Rochdale Highways during the scoping meeting on 6th September 2021.”

iRAP Star Rating Demonstrator Analysis

- 7.5.24 In addition to the TfGM analysis, iRAP analysis has been undertaken for each of the assessed links. The following **Table 7.7** provides Baseline (2022) iRAP Star Rating analysis:

Table 7.7 Baseline (2022) Highway Safety iRAP Calculations

Junction		Link		2022 Baseline iRAP Star Rating			
				Vehicles	Motorbikes	Pedestrians	Cyclists
SA1	Site Access (Southern)	a	B6225 Hollingworth Road (N)	4	4	3	4
		b	Site Access (S)	N/A	N/A	N/A	N/A
		c	B6225 Hollingworth Road (S)	4	4	3	4
SA2	Site Access (Northern)	a	B6225 Hollingworth Road (N)	4	4	3	4
		b	Site Access (S)	N/A	N/A	N/A	N/A
		c	B6225 Hollingworth Road (S)	4	4	3	4
1	A58 Halifax Road / Wardle Road roundabout	a	Wardle Road	4	4	3	3
		b	A58 Halifax Road (E)	4	4	4	3
		c	A58 Halifax Road (W)	4	4	4	3
2	A58 Halifax Road / Birch Road / Old Road signalised junction	a	Birch Road	4	3	4	3
		b	A58 Halifax Road (E)	4	4	3	5
		c	Old Road	4	4	3	3
		d	A58 Halifax Road (W)	4	4	3	5
3	A58 Halifax Road / Smithy Bridge Road signalised junction	a	A58 Halifax Road (E)	4	4	3	4
		b	Smithy Bridge Road	4	3	3	4
		c	A58 Halifax Road (W)	4	4	3	5

Junction		Link		2022 Baseline iRAP Star Rating			
				Vehicles	Motorbikes	Pedestrians	Cyclists
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	4	4	3	4
		b	B6225 Milnrow Road	4	4	3	4
		c	Smithy Bridge Road (W)	4	4	3	4
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	2	2	3	2
		b	The Beach Car Park	5	5	4	5
		c	Smithy Bridge Road (E)	5	5	4	5
		d	Milbury Drive	5	5	4	5
		e	B6225 Smithy Bridge Road (W)	2	2	3	2
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	2	2	3	2
		b	The Wine Press Car Park	5	5	4	5
		c	Rakewood Road	5	5	5	5
		d	B6225 Lake Bank	2	2	3	2
7	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A6033 Todmorden Road	4	4	3	4
		b	A58 Halifax Road (E)	4	4	3	4
		c	A58 Halifax Road (W)	4	4	3	3
8	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A58 Halifax Road (E)	4	3	3	3
		b	Canal Street	3	3	3	3
		c	A58 Halifax Road (W)	3	3	3	4
9	A640 Rochdale Road / B6225 Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction	a	A640 Rochdale Road	5	4	3	4
		b	B6225 Bridge Street	5	4	3	4
		c	A640 Elizabethan Way	4	3	2	3
		d	Wesley Street	4	4	3	3
10	B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout	a	B6225 Kiln Lane	4	4	4	4
		b	Dale Street	4	4	3	4
		c	B6225 Bridge Street	4	4	4	4
11	B6225 Wildhouse Lane / Kiln Lane junction	a	B6225 Wildhouse Lane	3	3	3	3
		b	Kiln Lane (E)	5	5	4	5
		c	B6225 Kiln Lane (W)	3	3	3	3

Baseline Fear and Intimidation Calculations

7.5.25 The following **Table 7.8** provides Baseline (2022) degree of hazard calculations:

Table 7.8 Baseline (2022) Degree of Hazard Calculations

Junction		Link		2022 Baseline Fear and Intimidation: Degree of Hazard			
				a	b	c	Total (a+b+c)
SA1	Site Access (Southern)	a	B6225 Hollingworth Road (N)	10	0	20	30
		b	Site Access (S)	0	0	0	0
		c	B6225 Hollingworth Road (S)	10	0	20	30
SA2	Site Access (Northern)	a	B6225 Hollingworth Road (N)	10	0	20	30
		b	Site Access (S)	0	0	20	20
		c	B6225 Hollingworth Road (S)	10	0	20	30
1	A58 Halifax Road / Wardle Road roundabout	a	Wardle Road	0	0	20	20
		b	A58 Halifax Road (E)	20	0	20	40
		c	A58 Halifax Road (W)	20	10	20	50
2	A58 Halifax Road / Birch Road / Old Road signalised junction	a	Birch Road	10	0	20	30
		b	A58 Halifax Road (E)	20	0	20	40
		c	Old Road	0	0	20	20
		d	A58 Halifax Road (W)	20	0	20	40
3	A58 Halifax Road / Smithy Bridge Road signalised junction	a	A58 Halifax Road (E)	10	0	20	30
		b	Smithy Bridge Road	0	0	20	20
		c	A58 Halifax Road (W)	20	0	20	40
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	10	0	20	30
		b	B6225 Milnrow Road	10	0	20	30
		c	Smithy Bridge Road (W)	0	0	20	20
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	10	0	20	30
		b	The Beach Car Park	0	0	0	0
		c	Smithy Bridge Road (E)	0	0	0	0
		d	Milbury Drive	0	0	20	20
		e	B6225 Smithy Bridge Road (W)	10	0	20	30
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	10	0	20	30
		b	The Wine Press Car Park	0	0	0	0
		c	Rakewood Road	0	0	10	10
		d	B6225 Lake Bank	10	0	20	30

Junction		Link		2022 Baseline Fear and Intimidation: Degree of Hazard			
				a	b	c	Total (a+b+c)
7	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A6033 Todmorden Road	10	0	20	30
		b	A58 Halifax Road (E)	10	0	20	30
		c	A58 Halifax Road (W)	10	0	20	30
8	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A58 Halifax Road (E)	0	0	20	20
		b	Canal Street	10	0	20	30
		c	A58 Halifax Road (W)	10	0	20	30
9	A640 Rochdale Road / B6225 Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction	a	A640 Rochdale Road	10	0	20	30
		b	B6225 Bridge Street	10	0	20	30
		c	A640 Elizabethan Way	10	0	30	40
		d	Wesley Street	0	0	20	20
10	B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout	a	B6225 Kiln Lane	10	0	20	30
		b	Dale Street	10	0	20	30
		c	B6225 Bridge Street	10	0	20	30
11	B6225 Wildhouse Lane / Kiln Lane junction	a	B6225 Wildhouse Lane	10	0	20	30
		b	Kiln Lane (E)	0	0	20	20
		c	B6225 Kiln Lane (W)	10	0	20	30

Baseline Evolution

- 7.5.26 In accordance with planning policy, the impact of the Proposed Development should be assessed for the application year (2024) and a future year. 2029, which is 5 years after the year of application, was agreed in principle with RBC Highways during scoping discussions.
- 7.5.27 In some cases, TEMPRO growth factors are applied to the traffic surveys to establish a future year base. However, in this instance, it is not considered that this would be appropriate.
- 7.5.28 It was agreed with RBC Highways that committed development flows were considered sufficient to capture any increases to traffic on the basis that traffic levels in the area were not increasing year on year (particularly in the traditional AM and PM peak periods), and that applying a growth factor is likely to result in double counting.
- 7.5.29 On this basis, the committed developments that have been identified for further consideration within the assessment are outlined in **Table 7.9** below:

Table 7.9 Cumulative Developments informing Baseline Evolution

LPA Ref	Site Address and Distance from proposed development Site	Description	Considered as Part of this Chapter?
21/01146/FUL	Former Akzo Nobel Site 0m (adjacent)	Residential development - erection of up to 127 residential dwellings including new vehicular access points, footpaths, cycle paths, boundaries, landscaping, creation of open space, a pumping station and other associated works.	Yes – due to proximity to site and number of additional trips.
20/00639/FUL	The Soccer Village (former Birchinley Manor Equestrian Centre), Wildhouse Lane, Milnrow, OL16 3TW 1,550m (south)	Demolition of existing buildings, hardstanding areas and sports pitches, and the erection of 47 dwelling houses including provision of associated roads, footways, public open space, parking areas, drainage, landscaping and boundary treatment along with ground levelling works, works to trees.	No, Transport Statement submitted demonstrates negligible impact (less than 1 trip per minute during peak hours).
21/00701/FUL (School was completed in March 2023)	Littleborough Community Primary School, Calderbrook Road, Littleborough, OL15 9HW 1,400m (north)	Part demolition of existing school / children's centre / gym, erection of a new school building of up to two storeys and erection of temporary classrooms, with reconfigured and additional car parking, access and landscaping	No, no change to staff / pupil numbers therefore no additional trips.
22/01039/FUL	Land To The West Of New Street Littleborough 400m (north-west)	Erection of a residential development for 61 dwellings (to include 2no. Use Class C2 residential care dwellings for children), access, landscaping, open space, SUDs, and associated works	No, Transport Statement submitted demonstrates negligible impact (less than 30 two-way trips during peak hours).
22/01364/FUL	Land West Of Smithy Bridge Road, Littleborough 700m (north-west)	Residential development: erection of up to 199 dwellings including vehicular access on to Smithy Bridge Road, with internal highways, car parking, footpaths, cycle paths, boundaries, gardens, open space and other associated works	Yes – due to proximity to site and number of additional trips.
20/00607/FUL (Scheme is largely completed and occupied)	Land Off New Road, Littleborough 200m (north)	Residential development of 100 dwellings together with associated access, earthworks, landscaping, public open space, and on-site infrastructure (including the capping of artesian well)	Yes – due to proximity to site and number of additional trips.
22/01568/FUL	Wardle Academy Birch 2,000m (north-west)	Part two / part single storey extension to school to create additional teaching facility, door to ground floor west elevation and relocation of site boundary gates	No, Transport Statement submitted demonstrates negligible impact.

Future Year ('No Development') Traffic Data Calculations

- 7.5.30 Considering the impact of the above committed developments, the following **Table 7.10** demonstrates 24-hour and 18-hour 2-way AADT flows for the assessment scope in a future year scenario (a 'no development' scenario which assumes the committed developments would come forward regardless of the status of the proposed development):

Table 7.10 Future Year (No Development) Traffic Flows

Junction		Link		Future Year 2-way AADT Flows (Vehicles)	
				24hr	18hr
SA1	Site Access (Southern)	a	B6225 Hollingworth Road (N)	13,633	13,276
		b	Site Access (S)	0	0
		c	B6225 Hollingworth Road (S)	13,633	13,276
SA2	Site Access (Northern)	a	B6225 Hollingworth Road (N)	13,633	13,276
		b	Site Access (S)	0	0
		c	B6225 Hollingworth Road (S)	13,633	13,276
1	A58 Halifax Road / Wardle Road roundabout	a	Wardle Road	9,221	8,980
		b	A58 Halifax Road (E)	25,154	24,496
		c	A58 Halifax Road (W)	32,749	31,893
2	A58 Halifax Road / Birch Road / Old Road signalised junction	a	Birch Road	11,910	11,598
		b	A58 Halifax Road (E)	26,814	26,113
		c	Old Road	170	165
		d	A58 Halifax Road (W)	24,736	24,090
3	A58 Halifax Road / Smithy Bridge Road signalised junction	a	A58 Halifax Road (E)	21,894	21,322
		b	Smithy Bridge Road	10,935	10,649
		c	A58 Halifax Road (W)	27,084	26,376
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	14,433	14,055
		b	B6225 Milnrow Road	18,261	17,784
		c	Smithy Bridge Road (W)	9,647	9,395
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	14,113	13,744
		b	The Beach Car Park	226	220
		c	Smithy Bridge Road (E)	139	135
		d	Milbury Drive	321	313
		e	B6225 Smithy Bridge Road (W)	14,124	13,755
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	13,633	13,276
		b	The Wine Press Car Park	144	140
		c	Rakewood Road	931	907
		d	B6225 Lake Bank	13,962	13,597
7	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A6033 Todmorden Road	14,656	14,272
		b	A58 Halifax Road (E)	16,627	16,193
		c	A58 Halifax Road (W)	14,598	14,216

Junction		Link		Future Year 2-way AADT Flows (Vehicles)	
				24hr	18hr
8	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A58 Halifax Road (E)	7,710	7,508
		b	Canal Street	14,304	13,930
		c	A58 Halifax Road (W)	17,303	16,850
9	A640 Rochdale Road / B6225 Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction	a	A640 Rochdale Road	19,824	19,305
		b	B6225 Bridge Street	22,904	22,305
		c	A640 Elizabethan Way	23,008	22,406
		d	Wesley Street	13	13
10	B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout	a	B6225 Kiln Lane	20,959	20,411
		b	Dale Street	13,678	13,320
		c	B6225 Bridge Street	21,719	21,151
11	B6225 Wildhouse Lane / Kiln Lane junction	a	B6225 Wildhouse Lane	17,996	17,525
		b	Kiln Lane (E)	5,158	5,023
		c	B6225 Kiln Lane (W)	18,837	18,345

Future Year ('No Development') Highway Safety Calculations

iRAP Star Rating Demonstrator Analysis

7.5.31 Considering the impact of the above committed developments, the following **Table 7.11** provides iRAP Star Rating analysis in a future year scenario ('no development'):

Table 7.11 Future Year (No Development) Highway Safety iRAP Calculations

Junction		Link		Future Year iRAP Star Rating			
				Vehicles	Motorbikes	Pedestrians	Cyclists
SA1	Site Access (Southern)	a	B6225 Hollingworth Road (N)	4	4	3	4
		b	Site Access (S)	N/A	N/A	N/A	N/A
		c	B6225 Hollingworth Road (S)	4	4	3	4
SA2	Site Access (Northern)	a	B6225 Hollingworth Road (N)	4	4	3	4
		b	Site Access (S)	N/A	N/A	N/A	N/A
		c	B6225 Hollingworth Road (S)	4	4	3	4

Junction		Link		Future Year iRAP Star Rating			
				Vehicles	Motorbikes	Pedestrians	Cyclists
1	A58 Halifax Road / Wardle Road roundabout	a	Wardle Road	4	4	3	3
		b	A58 Halifax Road (E)	4	4	4	3
		c	A58 Halifax Road (W)	4	4	4	3
2	A58 Halifax Road / Birch Road / Old Road signalised junction	a	Birch Road	4	3	4	3
		b	A58 Halifax Road (E)	4	4	3	5
		c	Old Road	4	4	3	3
		d	A58 Halifax Road (W)	4	4	3	5
3	A58 Halifax Road / Smithy Bridge Road signalised junction	a	A58 Halifax Road (E)	4	4	3	4
		b	Smithy Bridge Road	4	3	3	4
		c	A58 Halifax Road (W)	4	4	3	5
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	4	4	3	4
		b	B6225 Milnrow Road	4	4	3	4
		c	Smithy Bridge Road (W)	4	4	3	4
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	2	2	3	2
		b	The Beach Car Park	5	5	4	5
		c	Smithy Bridge Road (E)	5	5	4	5
		d	Milbury Drive	5	5	4	5
		e	B6225 Smithy Bridge Road (W)	2	2	3	2
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	2	2	3	2
		b	The Wine Press Car Park	5	5	4	5
		c	Rakewood Road	5	5	5	5
		d	B6225 Lake Bank	2	2	3	2
7	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A6033 Todmorden Road	4	4	3	4
		b	A58 Halifax Road (E)	4	4	3	4
		c	A58 Halifax Road (W)	4	4	3	3
8	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A58 Halifax Road (E)	4	3	3	3
		b	Canal Street	3	3	3	3
		c	A58 Halifax Road (W)	3	3	3	4
9	A640 Rochdale Road / B6225	a	A640 Rochdale Road	5	4	3	4

Junction		Link		Future Year iRAP Star Rating			
				Vehicles	Motorbikes	Pedestrians	Cyclists
	Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction	b	B6225 Bridge Street	5	4	3	4
		c	A640 Elizabethan Way	4	3	2	3
		d	Wesley Street	4	4	3	3
10	B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout	a	B6225 Kiln Lane	4	4	4	4
		b	Dale Street	4	4	3	4
		c	B6225 Bridge Street	4	4	4	4
11	B6225 Wildhouse Lane / Kiln Lane junction	a	B6225 Wildhouse Lane	3	3	3	3
		b	Kiln Lane (E)	5	5	4	5
		c	B6225 Kiln Lane (W)	3	3	3	3

Future Year ('No Development') Fear and Intimidation Calculations

7.5.32 Considering the impact of the above committed developments, the following **Table 7.12** provides degree of hazard calculations in a future year scenario ('no development'):

Table 7.12 Future Year (No Development) Degree of Hazard Calculations

Junction		Link		Future Year Fear and Intimidation: Degree of Hazard			
				a	b	c	Total (a+b+c)
SA1	Site Access (Southern)	a	B6225 Hollingworth Road (N)	10	0	20	30
		b	Site Access (S)	0	0	0	0
		c	B6225 Hollingworth Road (S)	10	0	20	30
SA2	Site Access (Northern)	a	B6225 Hollingworth Road (N)	10	0	20	30
		b	Site Access (S)	0	0	20	20
		c	B6225 Hollingworth Road (S)	10	0	20	30
1	A58 Halifax Road / Wardle Road roundabout	a	Wardle Road	0	0	20	20
		b	A58 Halifax Road (E)	20	0	20	40
		c	A58 Halifax Road (W)	20	10	20	50

Junction		Link		Future Year Fear and Intimidation: Degree of Hazard			
				a	b	c	Total (a+b+c)
2	A58 Halifax Road / Birch Road / Old Road signalised junction	a	Birch Road	10	0	20	30
		b	A58 Halifax Road (E)	20	0	20	40
		c	Old Road	0	0	20	20
		d	A58 Halifax Road (W)	0	0	20	20
3	A58 Halifax Road / Smithy Bridge Road signalised junction	a	A58 Halifax Road (E)	10	0	20	30
		b	Smithy Bridge Road	0	0	20	20
		c	A58 Halifax Road (W)	20	0	20	40
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	10	0	20	30
		b	B6225 Milnrow Road	10	0	20	30
		c	Smithy Bridge Road (W)	0	0	20	20
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	10	0	20	30
		b	The Beach Car Park	0	0	0	0
		c	Smithy Bridge Road (E)	0	0	0	0
		d	Milbury Drive	0	0	20	20
		e	B6225 Smithy Bridge Road (W)	0	0	20	20
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	10	0	20	30
		b	The Wine Press Car Park	0	0	0	0
		c	Rakewood Road	0	0	10	10
		d	B6225 Lake Bank	0	0	20	20
7	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A6033 Todmorden Road	10	0	20	30
		b	A58 Halifax Road (E)	10	0	20	30
		c	A58 Halifax Road (W)	10	0	20	30
8	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A58 Halifax Road (E)	0	0	20	20
		b	Canal Street	10	0	20	30
		c	A58 Halifax Road (W)	10	0	20	30

Junction		Link		Future Year Fear and Intimidation: Degree of Hazard			
				a	b	c	Total (a+b+c)
9	A640 Rochdale Road / B6225 Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction	a	A640 Rochdale Road	10	0	20	30
		b	B6225 Bridge Street	20	0	20	40
		c	A640 Elizabethan Way	20	0	30	50
		d	Wesley Street	0	0	20	20
10	B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout	a	B6225 Kiln Lane	10	0	20	30
		b	Dale Street	10	0	20	30
		c	B6225 Bridge Street	10	0	20	30
11	B6225 Wildhouse Lane / Kiln Lane junction	a	B6225 Wildhouse Lane	10	0	20	30
		b	Kiln Lane (E)	0	0	20	20
		c	B6225 Kiln Lane (W)	10	0	20	30

7.6 Primary and Tertiary Mitigation

Primary Mitigation

Construction

- 7.6.1 During the construction phase, it is envisaged that earthworks relating to the cut and fill balance will be retained and managed within the Hollingworth Road land parcel boundary. The construction of the Proposed Development will be phased accordingly to minimise off-site HGV movements.

Operation

- 7.6.2 The internal network of streets will be designed to encourage low vehicle speeds and create a safe and pleasant environment for pedestrians and cyclists. The internal road network will be designed based on the principles of local and national design guidance, maintaining a street hierarchy and connected routes within the Hollingworth Road land parcel, with routes for pedestrians and cyclists.
- 7.6.3 The internal site layout will be designed to promote active and sustainable travel. The majority of existing PRoW which traverse the Hollingworth Road land parcel can be retained and integrated into the layout of the proposed development with some minor diversions to ensure the land parcel delivers a high-quality design.

Tertiary Mitigation

Construction

- 7.6.4 An Outline CEMP will be submitted as part of the planning application, and it is envisaged that a Site Waste Management Plan (SWMP) will also be conditioned. These will seek to minimise the level of disruption caused during the construction phase of the Proposed Development.
- 7.6.5 Precise details of the plans will be agreed at a later stage, but it is envisaged that the plans will predominantly consist of:
- Agreed traffic management measures to restrict construction vehicles in certain locations and routes at certain times of the day;
 - Travel Plan initiatives to encourage workers to travel to the site in a sustainable manner; and
 - Considerate construction practices (such as wheel washing) to mitigate impacts which are considered elsewhere in Chapter 8(Air Quality) and Chapter 9 (Noise and Vibration) of the ES.

Operation

- 7.6.6 Electric vehicle (EV) charging infrastructure will be provided at the proposed development in line with the standards of Building Regulations Part S 2021. This encourages the uptake of EVs and helps reduce the use of petrol and diesel vehicles.

7.7 Assessment of Significant Likely Effects

Construction

- 7.7.1 The construction of the Proposed Development will result in a temporary increase of HGVs and cars carrying construction workers and materials on roads surrounding the development. This has potential impacts in relation to air, dust and noise which are considered within **Chapter 8(Air Quality)** and **Chapter 9 (Noise and Vibration)** of the ES, respectively.
- 7.7.2 The volume of construction traffic has not been determined in detail at this stage; however, this will be determined following appointment of an appropriate contractor. At this stage, based on previous experience on schemes of a similar scale, construction traffic is not expected to represent a significant increase in traffic, and additional flows on any one link would be below the 10% increase in traffic set out in the IEMA assessment threshold rules.
- 7.7.3 As the impact is considered to be less than 10%, no further assessment is necessary. The impact of the Proposed development at the construction phase is considered to be **Negligible** (temporary) and **not significant**. A summary of the effects of the construction phase is provided in **Table 7.18**.

Operation

- 7.7.4 In line with the IEMA guidance, the percentage impact of the development proposals has been calculated for each link in the following table. This assessment compares the future year 'no development' scenario (a scenario which assumes the committed developments would come forward regardless of the status of the Proposed Development) with the future year 'with development' scenario.

7.7.5 The junctions and links for assessment are included in the following tables.

Future Year Base + Development Traffic Flows

7.7.6 The following **Table 7.13** provides the future year scenario with proposed development traffic:

Table 7.13 Future Year (With Development) Traffic Flows

Junction		Link		Future Year with Development 2-way AADT Flows (Vehicles)	
				24hr	18hr
SA1	Site Access (Southern)	a	B6225 Hollingworth Road (N)	14,687	14,303
		b	Site Access (S)	1,994	1,942
		c	B6225 Hollingworth Road (S)	14,687	14,303
SA2	Site Access (Northern)	a	B6225 Hollingworth Road (N)	14,687	14,303
		b	Site Access (S)	666	649
		c	B6225 Hollingworth Road (S)	14,687	14,303
1	A58 Halifax Road / Wardle Road roundabout	a	Wardle Road	9,221	8,980
		b	A58 Halifax Road (E)	25,864	25,187
		c	A58 Halifax Road (W)	33,459	32,584
2	A58 Halifax Road / Birch Road / Old Road signalised junction	a	Birch Road	11,921	11,609
		b	A58 Halifax Road (E)	27,557	26,837
		c	Old Road	170	165
		d	A58 Halifax Road (W)	25,469	24,803
3	A58 Halifax Road / Smithy Bridge Road signalised junction	a	A58 Halifax Road (E)	22,534	21,945
		b	Smithy Bridge Road	11,289	10,993
		c	A58 Halifax Road (W)	27,872	27,143
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	16,148	15,726
		b	B6225 Milnrow Road	19,464	18,955
		c	Smithy Bridge Road (W)	10,159	9,894
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	15,872	15,457
		b	The Beach Car Park	226	220
		c	Smithy Bridge Road (E)	139	135
		d	Milbury Drive	365	355
		e	B6225 Smithy Bridge Road (W)	15,839	15,425
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	15,454	15,050
		b	The Wine Press Car Park	144	140
		c	Rakewood Road	931	907
		d	B6225 Lake Bank	15,783	15,371

Junction		Link		Future Year with Development 2-way AADT Flows (Vehicles)	
				24hr	18hr
7	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A6033 Todmorden Road	14,764	14,378
		b	A58 Halifax Road (E)	17,375	16,921
		c	A58 Halifax Road (W)	15,237	14,839
8	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A58 Halifax Road (E)	7,801	7,597
		b	Canal Street	15,143	14,747
		c	A58 Halifax Road (W)	18,051	17,579
9	A640 Rochdale Road / B6225 Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction	a	A640 Rochdale Road	20,099	19,573
		b	B6225 Bridge Street	24,001	23,374
		c	A640 Elizabethan Way	24,203	23,570
		d	Wesley Street	13	13
10	B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout	a	B6225 Kiln Lane	22,074	21,497
		b	Dale Street	13,678	13,320
		c	B6225 Bridge Street	22,833	22,236
11	B6225 Wildhouse Lane / Kiln Lane junction	a	B6225 Wildhouse Lane	19,110	18,611
		b	Kiln Lane (E)	5,158	5,023
		c	B6225 Kiln Lane (W)	19,952	19,431

7.7.7 The following **Table 7.14** provides the proposed development percentage impact assessments on the assessed links for the future year scenario. Those links where the Proposed Development traffic has not been assigned have a neutral percentage increase (i.e. 0.00%):

Table 7.14 Future Year (With Development) Traffic Flows – Percentage Impact

Junction		Link		Percentage Impact of Future Year with Development 2-way AADT Flows (Vehicles)	
				24hr	18hr
SA1	Site Access (Southern)	a	B6225 Hollingworth Road (N)	7.74%	7.74%
		b	Site Access (S)	N/A	N/A
		c	B6225 Hollingworth Road (S)	7.74%	7.74%

Junction		Link		Percentage Impact of Future Year with Development 2-way AADT Flows (Vehicles)	
				24hr	18hr
SA2	Site Access (Northern)	a	B6225 Hollingworth Road (N)	7.74%	7.74%
		b	Site Access (S)	N/A	N/A
		c	B6225 Hollingworth Road (S)	7.74%	7.74%
1	A58 Halifax Road / Wardle Road roundabout	a	Wardle Road	0.00%	0.00%
		b	A58 Halifax Road (E)	2.82%	2.82%
		c	A58 Halifax Road (W)	2.17%	2.17%
2	A58 Halifax Road / Birch Road / Old Road signalised junction	a	Birch Road	0.09%	0.09%
		b	A58 Halifax Road (E)	2.77%	2.77%
		c	Old Road	0.00%	0.00%
		d	A58 Halifax Road (W)	2.96%	2.96%
3	A58 Halifax Road / Smithy Bridge Road signalised junction	a	A58 Halifax Road (E)	2.92%	2.92%
		b	Smithy Bridge Road	3.23%	3.23%
		c	A58 Halifax Road (W)	2.91%	2.91%
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	11.88%	11.88%
		b	B6225 Milnrow Road	6.59%	6.59%
		c	Smithy Bridge Road (W)	5.31%	5.31%
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	12.47%	12.47%
		b	The Beach Car Park	0.00%	0.00%
		c	Smithy Bridge Road (E)	0.00%	0.00%
		d	Milbury Drive	13.71%	13.71%
		e	B6225 Smithy Bridge Road (W)	12.14%	12.14%
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	13.36%	13.36%
		b	The Wine Press Car Park	0.00%	0.00%
		c	Rakewood Road	0.00%	0.00%
		d	B6225 Lake Bank	13.04%	13.04%
7	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A6033 Todmorden Road	0.74%	0.74%
		b	A58 Halifax Road (E)	4.50%	4.50%
		c	A58 Halifax Road (W)	4.38%	4.38%
8	A58 Halifax Road / A6033 Todmorden Road signalised junction	a	A58 Halifax Road (E)	1.18%	1.18%
		b	Canal Street	5.87%	5.87%
		c	A58 Halifax Road (W)	4.32%	4.32%

Junction		Link		Percentage Impact of Future Year with Development 2-way AADT Flows (Vehicles)	
				24hr	18hr
9	A640 Rochdale Road / B6225 Bridge Street / A640 Elizabethan Way / Wesley Street signalised junction	a	A640 Rochdale Road	1.39%	1.39%
		b	B6225 Bridge Street	4.79%	4.79%
		c	A640 Elizabethan Way	5.20%	5.20%
		d	Wesley Street	0.00%	0.00%
10	B6225 Kiln Lane / Dale Street / B6225 Bridge Street roundabout	a	B6225 Kiln Lane	5.32%	5.32%
		b	Dale Street	0.00%	0.00%
		c	B6225 Bridge Street	5.13%	5.13%
11	B6225 Wildhouse Lane / Kiln Lane junction	a	B6225 Wildhouse Lane	6.19%	6.19%
		b	Kiln Lane (E)	0.00%	0.00%
		c	B6225 Kiln Lane (W)	5.92%	5.92%

7.7.8 **Table 7.14** demonstrates that all of the links are within the 30% assessment threshold. In consideration of this and in accordance with the IEMA Guidance, these links can be considered to be subject to a discernible environmental impact, unless they are considered particularly sensitive links. In these such cases, further assessment should be considered.

7.7.9 All of the links above are not considered sensitive links, as such no further assessment is required.

- **Table 7.14** above demonstrates that the following links breach the 10% impact threshold, and therefore should be considered for additional assessment if they are deemed particularly sensitive:
- 4a (B6225 Smithy Bridge Road (E) at the Smithy Bridge Road / B6225 Milnrow Road roundabout);
- 5a (B6225 Lake Bank at the B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction);
- 5d (Milbury Drive at the B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction);
- 5e (B6225 Smithy Bridge Road (W) at the B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction);
- 6a (B6225 Hollingworth Road at the B6225 Lake Bank / Rakewood Road / Hollingworth Road junction); and
- 6d (B6225 Lake Bank at the B6225 Lake Bank / Rakewood Road / Hollingworth Road junction).

7.7.10 Whilst six additional links have been identified above, these comprise areas of highway adjacent towards the south of the site access points. While there is nothing to suggest these sections should be considered particularly sensitive within the context of the IEMA Guidance, for robustness, the above links which have exceeded the 10% assessment threshold have been considered for further assessment in the following sections.

Operational Phase Severance

7.7.11 In accordance with the defined methodology, exceeding the 10% increase threshold in traffic flows results in a **Negligible** (permanent) and **not significant** change in severance on Links 4a, 5a, 5d, 5e, 6a, and 6d.

Operational Phase Road Vehicle Driver and Passenger Delay

7.7.12 The accompanying **Transport Assessment** uses Junctions 9 and LinSig modelling packages to measure any impacts on queuing and delay. **Table 7.15** below summarises these modelling results and provide an overview of any development impacts.

Table 7.15 Future Year (With and Without Development) Driver and Passenger Delay Comparison

Junction		Link		Delay (in s)					
				Future Year (No Development)		Future Year (With Development)		Change	
				AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	22.01	11.47	50.95	13.05	+28.94	+1.58
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	N/A	N/A	N/A	N/A	N/A	N/A
		d	Milbury Drive	14.27	14.14	15.86	15.21	+1.59	+1.07
		e	B6225 Smithy Bridge Road (W)	5.38	4.59	5.30	4.42	-0.08	-0.17
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	N/A	N/A	N/A	N/A	N/A	N/A
		d	B6225 Lake Bank	5.52	4.83	5.40	4.65	-0.12	-0.18

7.7.13 The results show an increase in delay of, at most, 28.94 seconds. This change in delay is considered to be minimal and unlikely to be discernible to existing road users when considering daily variations in traffic flow.

7.7.14 On this basis, the proposed development would be acceptable from a driver and passenger delay perspective as the Proposed Development traffic impacts would be **Negligible** (permanent) and **not significant**.

Operational Phase Non-motorised User Delay

- 7.7.15 In accordance with the defined methodology, a minor change in severance along Links 4a, 5a, 5d, 5e, 6a, and 6d (because of traffic flow increases) and exercising professional judgement in outlining there is currently no significant desire line for non-motorised users to cross these links, there would be a **Negligible** (permanent) and **not significant** effect on non-motorised user delay along the links.

Operational Phase Non-motorised Amenity

- 7.7.16 In accordance with the defined methodology, the increases in traffic flows along Links 4a, 5a, 5d, 5e, 6a, and 6d do not exceed the 50% threshold for amenity. Further to this, exercising professional judgement in outlining there is currently no significant desire line for non-motorised users to cross Links 4a, 5a, 5d, 5e, 6a, and 6d, effects on Non-motorised Amenity are considered to be **Negligible** (permanent) and **not significant**.

Operational Phase Road User and Pedestrian Safety Calculations (iRAP Star Rating Demonstrator Analysis)

- 7.7.17 The following **Table 7.16** provides a comparison of iRAP Star Rating analysis for the future year with and without the proposed development in place:

Table 7.16 Future Year (With and Without Development) Highway Safety iRAP Comparison

Junction		Link		Future Year (No Development) iRAP Star Rating			
				Vehicles	Motorbikes	Pedestrians	Cyclists
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	4	4	3	4
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	2	2	3	2
		d	Milbury Drive	5	5	4	5
		e	B6225 Smithy Bridge Road (W)	2	2	3	2
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	2	2	3	2
		d	B6225 Lake Bank	2	2	3	2

Junction		Link		Future Year (With Development) iRAP Star Rating			
				Vehicles	Motorbikes	Pedestrians	Cyclists
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	4	4	3	4
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	2	2	3	2
		d	Milbury Drive	5	5	4	5
		e	B6225 Smithy Bridge Road (W)	2	2	3	2
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	2	2	3	2
		d	B6225 Lake Bank	2	2	3	2

- 7.7.18 There are no changes in iRAP scores as a result of the proposed development. In accordance with the defined methodology and applying professional judgment, the effects on Road User and Pedestrian Safety would be **Negligible** (permanent) and **not significant**.

Operational Phase Fear and Intimidation Calculations

- 7.7.19 The following **Table 7.17** provides a comparison of Degree of Hazard analysis for the future year with and without the Proposed Development in place:

Table 7.17 Future Year (With and Without Development) Degree of Hazard Comparison

Junction		Link		Future Year (No Development) Fear and Intimidation: Degree of Hazard			
				a	b	c	Total (a+b+c)
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	10	0	20	30
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	10	0	20	30
		d	Milbury Drive	0	0	20	20
		e	B6225 Smithy Bridge Road (W)	0	0	20	20
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	10	0	20	30
		d	B6225 Lake Bank	0	0	20	20

Junction		Link		Future Year (With Development) Fear and Intimidation: Degree of Hazard			
				a	b	c	Total (a+b+c)
4	Smithy Bridge Road / B6225 Milnrow Road roundabout	a	B6225 Smithy Bridge Road (E)	10	0	20	30
5	B6225 Smithy Bridge Road / Lake Bank / The Beach Car Park / Smithy Bridge Road / Milbury Drive junction	a	B6225 Lake Bank	10	0	20	30
		d	Milbury Drive	0	0	20	20
		e	B6225 Smithy Bridge Road (W)	0	0	20	20
6	B6225 Lake Bank / Rakewood Road / Hollingworth Road junction	a	B6225 Hollingworth Road	10	0	20	30
		d	B6225 Lake Bank	0	0	20	20

7.7.20 There is no change to the Degree of Hazard, which remains in the 'small' and 'moderate' categories (for Links 5d, 5e 6d, and Links 4a, 5a, 6a respectively) following the Proposed Development. In accordance with the defined methodology and applying professional judgment, the effects on Fear and Intimidation would be **Negligible** (permanent) and **not significant**.

7.8 Secondary Mitigation and Enhancement

Construction

7.8.1 It is not envisaged that there would be any secondary mitigation measures during the construction stage. This is because it is not anticipated that there would be any significant effects on traffic and transport receptors as a result of the Proposed Development, therefore secondary mitigation measures are not required.

Operation

7.8.2 The application for the Proposed Development is supported by a **Framework Travel Plan (FTP)** which aims to minimise the number of car trips generated by the Proposed Development and encourage residents to use sustainable modes of transport. It is typical during the planning application process that a full Travel Plan will be conditioned prior to / following occupation of the scheme. This includes an update to the existing situation initially outlined within the FTP, alongside further commitment to implementing these measures and methods of monitoring the effectiveness of the Travel Plan.

7.8.3 Notwithstanding, measures detailed in the Travel Plan will help to mitigate the impacts of the traffic associated with the proposed development and to encourage modal shifts in the long run. These include:

- Appointment of a Travel Plan Coordinator (TPC) to implement and manage the Travel Plan;
- Provision of Welcome Packs to all residents associated with the proposed development, comprising:
 - Introduction to the Travel Plan concept detailing objectives and aspirations;

- The health benefits of walking and cycling, and the environmental benefits of sustainable modes of transport;
 - Location map of the Hollingworth Road land parcel highlighting travel related facilities, such as bus stops, cycle stands, walking and cycling routes, and places of interest;
 - Links to up-to-date public transport services, i.e. public transport operator websites with timetables and routes; and
 - Details of the TPC.
- Measures to encourage walking, such as clear signage of pedestrian routes within and adjacent to the Hollingworth Road land parcel;
 - Measures to encourage cycling, such as the promotion of cycling information, provision of signage in and around the Hollingworth Road land parcel to neighbouring cycle links, alongside details of local cycle shops;
 - Measures to encourage public transport, such as distribution of TfGM's Journey Planning tools; and
 - Promotion of car sharing schemes for people who travel to the same location each day.

7.9 Residual Effects

Construction

- 7.9.1 The residual effects of construction vehicles upon the traffic and transport-related environmental factors are anticipated to be **Negligible** (temporary) and **not significant**. As discussed, the construction phase will be supported by a CEMP to ensure that any disruption caused during the construction phase of the Proposed Development will be minimised.

Operation

- 7.9.2 The highway impacts of the traffic predicted to be generated by the Proposed Development have been properly assessed at key junctions on the road network within the **Transport Assessment**. For all of the junctions assessed, the Proposed Development would be acceptable from an operational highways perspective as the Proposed Development traffic effect would be **Negligible** (permanent) and **not significant**.

7.10 Cumulative Effects

Please refer to Volume 1: Chapter 10 for the cumulative assessment for the Hollingworth Road land parcel and Rakewood Road land parcel.

7.11 Monitoring

- 7.11.1 No significant residual adverse effects have been identified; therefore no monitoring of such effects has been considered.

7.12 Consideration of Climate Change

- 7.12.1 This section should align, and be read in conjunction with **Chapter 11 (Climate Change)** which sets out the projected climatic changes in greater detail. IEMA's EIA Guide to Climate Change Resilience & Adaptation (2020) states that "*where adaptation is considered in EIA it must be clearly presented within the EIA Report*".
- 7.12.2 Climate change impacts include:
- Long term changes to climatic norms, including an overall increase in annual temperatures;
 - Hotter, drier summers;
 - Warmer, wetter winters; and
 - Increase in frequency and intensity of extreme weather events such as heatwaves, droughts, and heavy rainfall.
- 7.12.3 The above impacts would not result in a direct impact on traffic and transport. There may be indirect impacts, for example, rail buckling under higher temperatures, or an increase in the risk of flooding associated with greater rainfall, which may result in the existing highway and public transport networks being compromised, however it would not be possible to quantify the above impacts at this stage.
- 7.12.4 Notwithstanding, measures detailed in the Travel Plan which would aim to encourage modal shifts in the long run (as an alternative to private / single-occupancy vehicle trips) could achieve longer term emission savings. This could potentially mitigate the climate change impacts, however as above it would not be possible to quantify the above impacts at this stage as the development has not been completed / occupied.
- 7.12.5 There would also be a drainage strategy submitted as part of the planning application, which details further assessments by taking into account future climate change projections.
- 7.12.6 On this basis, no further assessment nor mitigation is necessary.
- 7.12.7 The significance of the effects of climate change on the Proposed Development at the construction and operational phase on severance, road vehicle driver and passenger delay, non-motorised user delay and amenity, road user and pedestrian safety, and fear and intimidation are considered to be **Negligible** and **not significant**.

7.13 Conclusions

- 7.13.1 This chapter of the ES has been prepared by Curtins and assesses the likely significant effects of the Proposed Development on the environment in respect of Traffic and Transport. The chapter should be read alongside a accompanying documentation:
- **Transport Assessment**, document reference 079716-CUR-XX-XX-T-TP-00001.
 - **Framework Travel Plan**, document reference 079716-CUR-XX-XX-T-TP-00002.
- 7.13.2 A review of relevant local and national transport planning guidance such as the NPPF and the Rochdale Core Strategy has been undertaken. It is considered that the Proposed Development conforms with the relevant aspects of such policy.

- 7.13.3 Curtins has undertaken scoping discussions with RBC Highways and TfGM which determined the location of baseline traffic counts in relation to the Traffic and Transport study area, and the respective modelling parameters.
- 7.13.4 The recent publication of updated IEMA Guidelines in July 2023 provides an update to the 'Guidelines for the Environmental Assessment of Road Traffic', published in 1993, and forms the basis for the methodology found within this chapter.
- 7.13.5 The construction phase of the Proposed Development will result in a temporary increase in HGVs and cars carrying construction workers and materials on roads surrounding the Hollingworth Road land parcel. This has potential impacts in relation to noise, air, dust and dirt which are considered elsewhere within the wider ES. The volume of construction traffic has not been determined in detail at this stage, but based on previous experience, it is not expected to represent a significant increase in traffic and will be suitably mitigated Construction Environment Management Plan (CEMP) so that residual effects will be **Negligible** (temporary) and **not significant**.
- 7.13.6 With regards to the operational phase of the Proposed Development, all links are within the 30% assessment threshold. In consideration of this and in accordance with the IEMA Guidance, all links can be considered to be subject to a discernible environmental impact, unless they are considered particularly sensitive links.
- 7.13.7 Six additional links were identified to breach the 10% threshold impact threshold, and therefore should be considered for additional assessment if they are deemed particularly sensitive, namely Links 4a, 5a, 5d, 5e, 6a, and 6d. There is nothing to suggest these highway links should be considered particularly sensitive within the context of the IEMA Guidance.
- 7.13.8 However, for robustness, the above links which have exceeded the 10% assessment threshold have been considered for further assessment. As detailed within this Chapter, the above links have been duly considered, and suitably mitigated so that the residual effects will be **Negligible** (permanent) and **not significant**.
- 7.13.9 **Table 7.18** contains a summary of the likely significant effects of the Proposed Development. It is concluded that the development meets the sustainability objectives of the NPPF and that its residual traffic impacts are negligible. From a Traffic and Transport perspective, there are no reasons why the proposed development should not be granted planning approval.

7.14 References

- Department for Levelling Up, Housing and Communities (2023) *National Planning Policy Framework*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf.
- Department for Levelling Up, Housing and Communities (2014) *Planning Practice Guidance – Travel Plans, Transport Assessments and Statements*. Available at: <https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements>.
- Transport for Greater Manchester (2017) *Greater Manchester Transport Strategy 2040*. Available at: <https://tfgm.com/2040-transport-strategy>.
- Rochdale Borough Council (2016) *Core Strategy*. Available at: <https://www.rochdale.gov.uk/downloads/download/266/core-strategy>.
- Institute of Environmental Management and Assessment (2023) *New IEMA Guidance: Environmental Assessment of Traffic and Movement – July 2023*. Available at: <https://tfgm.com/2040-transport-strategy>.

8 Air Quality

8.1 Introduction

- 8.1.1 This chapter assesses the potential likely air quality effects associated with the Proposed Development. The purpose of this chapter is to describe and evaluate the likely air quality impacts (during construction and operation) and classify the effects of the proposed development considering relevant national, regional and local regulations and guidance.
- 8.1.2 The Air Quality Assessment was carried out by air quality consultants at Stantec UK Limited, all of whom are registered with the Institute of Air Quality Management (IAQM).
- 8.1.3 In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in Volume 1: **Appendix D**.

8.2 Legislation, Policy Context, Guidance and Standards

Legislation

- 8.2.1 The applicable legislation framework is summarised as follows, with full details provided in **Appendix F.1**:
- The Air Quality Standards Regulations (AQSR) 2010 and subsequent amendments;
 - Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019;
 - The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020;
 - Part IV of the Environment Act 1995;
 - The Environmental Act 2021; and
 - The Environmental Targets (Fine Particulate Matter) Regulations 2023.

National Policy

- 8.2.2 The following relevant national policies have informed the assessment and further details are provided in **Appendix F.1**:
- Paragraphs 108, 109, 180, 191, 192 and 193 of the National Planning Policy Framework (Department for Levelling Up, Housing and Communities (DLUHC), 2023)
 - Paragraphs 005, 006, 007 and 008 of the corresponding Air Quality Planning Practice Guidance (Ministry of Housing, Communities & Local Government, 2019).
 - The Environmental Improvement Plan 2023 (DEFRA, 2023a);
 - The Department for Environment, Food and Rural Affairs' (DEFRA's) Air Quality Strategy for England, Scotland, Wales and Northern Ireland (DEFRA, 2023b);
 - Clean Air Strategy 2023 (DEFRA, 2023c);

- Clean Air Strategy 2019 (DEFRA, 2019); and
- Air Quality Plan for Nitrogen Dioxide (NO₂) in UK (DEFRA, 2018);

Local Policy

8.2.3 The following relevant local policies have informed the assessment, and full details are provided in **Appendix F.1**:

- Rochdale Core Strategy: Policies C6, G9, T1, T2, DM1, DM2 (Rochdale Borough Council (RBC, 2016);
- Rochdale Borough Transport Strategy (RBC, 2014);
- Rochdale Climate Change Strategy and Delivery Plan – a partnership approach (2021-2025) (RBC, 2022);
- Greater Manchester Clean Air Plan (GMCA, 2023);
- Greater Manchester Strategy (2021-2031) (Greater Manchester Combined Authority (GMCA), 2021a);
- Greater Manchester Air Quality Action Plan 2016-2021 (GMCA, 2021b);
- Greater Manchester Transport Strategy 2040 (GMCA, 2021c); and
- Greater Manchester Low Emission Strategy (GMCA, 2016).

Guidance

8.2.4 The following guidance documents have been used during the preparation of this chapter, with full details provided in **Appendix F.1**:

- DEFRA 'Local Air Quality Management Technical Guidance (LAQM.TG (22))' v1, 2022 (DEFRA, 2022);
- Environmental Protection UK (EPUK) / Institute of Air Quality Management (IAQM) 'Land-Use Planning & Development Control: Planning for Air Quality' v1.2, 2017 (EPUK / IAQM, 2017); and
- IAQM 'Guidance on the Assessment of Dust from Demolition and Construction', v2.1, 2024 (IAQM, 2024).

8.3 Consultation

8.3.1 An air quality chapter of the EIA Scoping Report was prepared by Stantec in February 2023 and issued to RBC. The Scoping Report chapter outlined the proposed scope and methodology of the air quality assessment to be presented in the ES. The Scoping Opinion received from RBC confirmed that air quality should be scoped into the ES and stated that consideration should be given to air quality impacts along the A58 from increased vehicle emissions resulting from the proposed development.

8.3.2 No further consultation in relation to air quality has been carried out at the time of writing this ES chapter.

8.4 Methodology

Study Area

- 8.4.1 For the construction dust risk assessment, the study area (based on IAQM construction dust guidance) is defined as comprising the area up to 250 m from the boundary of the Hollingworth Road land parcel and 50 m from the route used by construction vehicles (up to 250 m from the site entrances).
- 8.4.2 For the assessment of construction and operational phase road traffic emissions on sensitive human receptors, the study area (based on EPUK / IAQM guidance) includes the Hollingworth Road land parcel, all major roads (and adjacent properties) within 250 m of the Hollingworth Road land parcel boundary and other relevant roads (and adjacent properties) predicted to exceed the screening criteria outlined in **Appendix F.3** as a result of the Proposed Development. The study area has focused on the roads and junctions within 250 m of sensitive receptors that are expected to experience the greatest impacts as a result of an increase in road traffic associated with the Proposed Development.

Baseline Data Collection

- 8.4.3 Any exceedances of the limit values along roads within the study area have been identified using the 2020 NO₂ and PM Projections Data published by DEFRA (DEFRA, 2020a). Information on baseline air quality in the study area has been obtained by collating the results of monitoring carried out by RBC and its LAQM reports to identify potential Air Quality Management Areas (AQMAs). Background concentrations for the study area have been defined using the national pollution maps published by DEFRA which cover the whole country on a 1x1 km grid (DEFRA, 2020b).

Assessment of Construction Dust Impacts

- 8.4.4 During demolition and construction, dust from on-site activities and off-site trackout by construction vehicles has the potential to impact on sensitive human receptors within the study area. The main potential impacts are loss of amenity (as a result of dust soiling) and deterioration of human health (as a result of concentrations of PM₁₀) and harm to sensitive ecological receptors.
- 8.4.5 The suspension of particles in the air is dependent on surface characteristics, weather conditions and on-site activities. Impacts have the potential to occur when dust generating activities coincide with dry, windy conditions, and where sensitive receptors are located downwind of the dust source(s).
- 8.4.6 Separation distance is also an important factor. Large dust particles (greater than 30 µm), can be responsible for dust annoyance, will largely deposit within 100 m of sources. Intermediate particles (10-30 µm) can travel 200-500 m. Consequently, significant dust annoyance is usually limited to within a few hundred metres of its source. Smaller particles (less than 10 µm), which are the predominant fraction, can be responsible for human health impacts as they largely remain airborne. However, the impact on the short-term concentrations of PM₁₀ occurs over a shorter distance due to the rapid decrease in concentrations with distance from the source due to dispersion.
- 8.4.7 The assessment of the risk of potential construction dust impacts has been undertaken with reference to relevant guidance (IAQM, 2024).

Screening Assessment

- 8.4.8 The first stage of the assessment involves screening to determine if there are existing sensitive receptors within threshold distances of the activities associated with the

construction phase of the proposed development; defined as the study area. No further assessment is required if there are no receptors within the study area.

8.4.9 The IAQM guidance outlines that an assessment is only required in cases where:

- A 'human receptor' is located within:
 - 250 m of the boundary of the site; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).
- An 'ecological receptor' is located within:
 - 50 m of the boundary of the site; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

Further Assessment

8.4.10 The risk of impacts associated with dust soiling and PM₁₀ caused by the Proposed Development has been determined (following the IAQM guidance (IAQM, 2024)) based on the dust emission class (or magnitude) for each activity arising from four activities in the absence of mitigation (demolition, earthworks, construction and trackout), the sensitivity of nearby receptors and the overall sensitivity of the area.

8.4.11 The dust emission class, receptor sensitivity and the overall sensitivity of the area are determined using the criteria outlined in **Table 1.2.1**, **Table 1.2.2**, **Table 1.2.3**, **Table 14.2.4** and **Table 1.2.5** of **Appendix F.2** (based on the IAQM guidance), indicative thresholds and professional judgement. The risk of dust impacts arising is a product of the relationship between the dust emission magnitude and the area sensitivity and is based on the criteria outlined in **Table 1.2.6** (based on the IAQM guidance). The risk of impact is then used to determine the mitigation requirements.

8.4.12 The IAQM guidance recommends that no assessment of the significance of effects should be made without mitigation in place, as mitigation is assumed to be secured by planning conditions, legal requirements or required by regulations.

8.4.13 With appropriate mitigation in place, the IAQM guidance indicates that the residual effect of dust emissions associated with the demolition and construction can be classified as being 'not significant'.

Assessment of Demolition and Construction Road Traffic Emission Impacts

8.4.14 The potential for a significant overall effect on existing sensitive receptors within the study area as a result of emissions from demolition and construction traffic generated by the Proposed Development has been determined qualitatively, taking into consideration the screening criteria outlined in the EPUK / IAQM guidance (EPUK / IAQM, 2017) (see **Appendix F.3**), the anticipated routing of the generated traffic and the anticipated duration of impacts associated with the generated traffic.

Assessment of Operational Road Traffic Emission Impacts

Screening Assessment

- 8.4.15 The potential for significant impacts on existing sensitive human receptors within the study area as a result of emissions from traffic generated by the Proposed Development is determined based on the screening criteria outlined in the EPUK / IAQM guidance (see **Appendix F14.3**). The screening assessment includes consideration of the volume and composition of traffic generated by the Proposed Development and existing local air quality conditions (i.e. the presence of any declared AQMAs).
- 8.4.16 In relation to proposed sensitive receptors within the Hollingworth Road land parcel, a qualitative assessment is initially undertaken to identify the potential for exceedances of the relevant National Air Quality Objectives (NAQOs), as defined in **Appendix F.1**, at sensitive locations within the land parcel. This takes into account future baseline air quality conditions within and in close proximity to the land parcel, and the proximity of sensitive locations within the land parcel to nearby sources of emissions to air.
- 8.4.17 Where it is not possible to screen out the potential for significant impacts, then a detailed assessment will be undertaken, which is the case for the operational phase in this chapter of the ES.

Detailed Assessment

- 8.4.18 Concentrations of pollutants (NO₂, PM₁₀ and PM_{2.5}) have been predicted for a range of worst-case locations of relevant human receptor exposure both at sensitive existing receptors and within the application site itself. This is to allow comparison with the NAQOs (for existing receptors only) and determination of the significance of impacts at each receptor.
- 8.4.19 Emissions from road vehicles and their resultant impact at receptor (existing and proposed) locations have been predicted using the ADMS-Roads dispersion model (v5.0.1.3). The model requires the user to provide various input data, including traffic flows (in AADT format), vehicle composition (i.e. the proportion of Heavy Duty Vehicles (HDVs)), road characteristics (including road width, gradient and street canyon dimensions, where applicable), and average vehicle speed. AADT flows and the proportions of HDVs, for roads within the study area, have been provided by the project's transport consultants, Curtins. Traffic data used in this assessment are summarised in **Table 1.4.3**, **Appendix F.4**. The modelled roads are shown in **Figure F.1**, **Appendix 1.7**.
- 8.4.20 The following traffic scenarios have been modelled:
- 2022 'existing' baseline for model verification;
 - 'Do Minimum' (DM) including committed developments, without the proposed development; and
 - 'Do Something' (DS) including committed developments, with the fully built-out proposed development.
- 8.4.21 As the DM and DS scenarios contain committed developments, the impacts of the committed developments are inherently assessed within this chapter. A list of these cumulative developments is presented in Volume 1: **Chapter 5 Assessment Methods** of the ES.
- 8.4.22 The model also requires meteorological data and has been run using 2022 meteorological data from the Bingley No.2 meteorological station, which is considered the most suitable for the study area due to the proximity (approximately 25.6 km to the north-east of the

Hollingworth Road land parcel) and elevation of the meteorological station in relation to the land parcel. **Appendix F.4** provides further details on the model inputs.

8.4.23 Traffic emissions have been calculated using the Emission Factor Toolkit (EFT) v12.0.1 (DEFRA, 2023d), which utilises NO_x emission factors taken from the European Environment Agency (EEA) COPERT 5.6 emission tool. The traffic data were entered into the EFT to provide emission rates for each of the road links entered into the model. Road vehicular emissions are primarily associated with the exhaust emissions but also include particles generated from abrasion (of tyres, brakes and road). The EFT allows users to calculate road vehicle pollutant emission rates for NO_x, PM₁₀ and PM_{2.5} (exhaust and brake, tyre and road wear) for a specified year, road type, vehicle speed and vehicle fleet composition.

8.4.24 The EFT provides pollutant emission rates for 2018 through to 2050 for England (not London), and 2018 to 2030 for Wales, Scotland, Northern Ireland and London, and takes into consideration bespoke vehicle fleet information as well as the following information available from the National Atmospheric Emissions Inventory:

- fleet composition data for motorways, urban and rural roads in the UK;
- fleet composition based on European emission standards from pre-Euro I to Euro6/VI (including Euro 6 subcategories);
- vehicle size distributions;
- scaling factors reflecting improvements in the quality of fuel and some degree of retrofitting;
- technology conversions in the national fleet; and
- primary NO₂ (f-NO₂) emission factors for road transport.

8.4.25 Road vehicle exhaust emissions of NO_x are projected to decrease year-on-year due to technological advances and improvements to the fleet mix i.e. penetration of Euro VI HDVs, which recent research suggests are performing well. Whilst there has been uncertainty over NO_x emissions from vehicle exhausts (particularly from Euro 5 and 6 LDVs) it is important to note that the EFT is not based on the Euro emission standards.

8.4.26 Generally, concentrations of air pollutants in the UK are anticipated to decrease in the coming years; as such, in most cases, the earlier the year that is assessed, the more worst-case the assessment is. The earliest year that the Proposed Development could potentially be occupied by is 2025. Therefore, in order to take account of uncertainties relating to future year vehicle emissions and background pollutant concentrations and to provide a conservative assessment, the assessment has been carried out utilising 2025 emission factors and background concentrations in combination with traffic data which includes committed development and full development flows. This is considered a conservative assumption of emissions in the future.

Air Quality Impacts Significance Criteria

8.4.27 The relevant NAQOs are set out in **Table 1.1.1** of **Appendix F.1**. The predicted pollutant concentrations in the DS traffic scenario at each identified sensitive receptor have been compared to the relevant NAQOs and any exceedances identified.

8.4.28 Analysis of long-term monitoring data suggests that if the annual mean NO₂ concentration is less than 60 µg/m³ then the 1-hour mean NO₂ NAQO is unlikely to be exceeded where road transport is the main source of pollution. Therefore, this concentration has been used to screen whether the one-hour mean objective is likely to be achieved (DEFRA, 2022).

Analysis of long-term monitoring data also suggests that if the annual mean PM₁₀ concentration is less than 32 µg/m³ then the 24-hour mean PM₁₀ NAQO is unlikely to be exceeded where road transport is the main source of pollution. Therefore, this concentration has been used to screen whether the 24-hour mean NAQO is likely to be achieved.

- 8.4.29 There is no official guidance in the UK on how to assess the significance of the impacts of existing air quality on a new development. The assessment of proposed sensitive receptors within the application site has therefore been limited to predicting pollutant concentrations at worst-case receptors within the application site and comparing these predicted concentrations to the relevant NAQOs, with the overall significance being based on whether the NAQOs for each pollutant are exceeded or not.
- 8.4.30 There is no official guidance in the UK on how to assess the significance of the air quality impacts of a new development on existing receptors. The approach developed by EPUK and the IAQM (EPUK / IAQM, 2017), which considers the change in air quality as a result of a proposed development on existing sensitive receptors in combination with baseline concentrations at the receptors, has therefore been used. The guidance sets out three stages: determining the magnitude of change at each receptor, describing the impact, and assessing the overall significance. Impact magnitude relates to the change in pollutant concentration; the impact description relates this change to the NAQO and is shown in Table 8.1 below.

Table 8.1 Impact Significance Criteria

Long term average concentration at receptor in assessment year	% Changes in concentration with development in relation to NAQO			
	1	2-5	6-10	>10
> 110 % ^a	Moderate	Substantial	Substantial	Substantial
>102% - ≤110% ^b	Moderate	Moderate	Substantial	Substantial
>95% - ≤102% ^c	Slight	Moderate	Moderate	Substantial
>75% - ≤95% ^d	Negligible	Slight	Moderate	Moderate
≤75% ^e	Negligible	Negligible	Slight	Moderate

Where concentrations increase the impact is described as adverse, and where it decreases as beneficial.

% change rounded to nearest whole number. Where the % change is 0 (i.e. less than 0.5%) the impact will be 'negligible'.

^a NO₂ or PM₁₀: > 44 µg/m³ annual mean; PM_{2.5} >22 µg/m³ annual mean; PM₁₀ >35.2 µg/m³ annual mean (days).

^b NO₂ or PM₁₀: > 40.8 – ≤ 44 µg/m³ annual mean; PM_{2.5} > 20.4 – ≤22 µg/m³ annual mean; PM₁₀ >32.64 – ≤35.2 µg/m³ annual mean (days).

^c NO₂ or PM₁₀: > 38 – ≤40.8 µg/m³ annual mean; PM_{2.5} >19 – ≤20.4 µg/m³ of annual mean; PM₁₀ >30.4 – ≤32.64 µg/m³ annual mean (days).

^d NO₂ or PM₁₀: >30 – ≤38 µg/m³ annual mean; PM_{2.5} >15 – ≤19 µg/m³ annual mean; or <24 – ≤ 30.4 µg/m³ annual mean (days).

^e NO₂ or PM₁₀: ≤30 µg/m³ annual mean; PM_{2.5} ≤15 µg/m³ annual mean; PM₁₀ ≤24 µg/m³ annual mean (days).

- 8.4.31 The guidance states that the overall assessment of significance should be based on professional judgement, taking into account factors including:
- the number of properties affected by 'slight', 'moderate' or 'substantial' adverse air quality impacts and a judgement on the overall balance;
 - the magnitude of the changes and the descriptions of the impacts at the receptors;
 - whether or not an exceedance of an NAQO is predicted to arise in the operational study area (where there are significant changes in traffic) where none existed before or an exceedance area is substantially increased;

- the uncertainty, comprising the extent to which worst-case assumptions have been made; and
- the extent to which an NAQO is exceeded.

8.4.32 Therefore, where impacts at an individual receptor are classified as 'negligible' or 'slight', effects would typically be considered 'not significant'. However, where 'moderate' or 'substantial' adverse impacts are identified at individual receptors, the overall effect needs to be considered in the round, taking into account the changes at all of the modelled receptor locations, with a judgement made as to whether the overall air quality effect of the development is 'significant' or 'not significant'.

Limitations

8.4.33 There are many components that contribute to the uncertainty in predicted concentrations. The model used in this assessment is dependent upon the traffic data that have been input, which will have inherent uncertainties associated with them. There is then additional uncertainty as the model is required to simplify real-world conditions into a series of algorithms. A summary of the assumptions and limitations used in this assessment is set out below:

- There has been an acknowledged disparity between national road transport emissions projections and measured annual mean concentrations of nitrogen oxides (NO_x) and NO₂ for many years. Recent monitoring has shown that reductions in concentrations are now being measured in many parts of the country (Air Quality Consultants Ltd., 2022); however, there is still some uncertainty regarding the rate at which emissions will reduce in the future and therefore some consideration must be given to the accuracy of any projection and to appropriately respond to this.
- It has been assumed that meteorological conditions recorded at the Bingley No.2 meteorological station in 2022 are representative of those at the Hollingworth Road land parcel in 2025, the anticipated year of first occupation.
- The complete development modelling has been based on emission factors and background concentrations for the first year of development occupation in 2025, combined with traffic flows which include committed developments and the full build-out of the proposed development. The model has been verified against 2022 monitoring data. This is considered to provide an appropriately conservative assessment taking into account the uncertainties regarding future vehicle emission factors.
- The default fleet projections in the DEFRA's 2018-based background maps are based on fleet growth assumptions which were current before the Covid-19 outbreak in the UK. As a result, default outputs from these tools do not reflect short- or longer-term impacts on emissions in 2020 and potentially beyond resulting from behavioural change during lockdowns.

8.5 Baseline Conditions

Sensitive Receptors

8.5.1 Relevant sensitive human receptor locations are places where members of the public might be expected to be regularly present over the averaging period of the NAQOs. Locations sensitive to the NO₂ annual and 1-hour, as well as PM₁₀ and PM_{2.5} annual mean NAQOs include existing and proposed residences, existing care homes, existing and proposed schools and nurseries within the study area. When identifying these receptors, particular attention has been paid to assessing impacts close to junctions, traffic lights and

roundabouts where traffic may become congested; where there is a combined effect of several road links and routes along which substantial volumes of traffic generated by the Proposed Development will travel.

- 8.5.2 Based on these criteria, 49 existing residential properties, three care homes, two schools and two nurseries within the study area, as well as three proposed residential dwellings and a primary school within the land parcel itself, have been identified as worst-case receptors for the assessment. The locations of these receptors have been chosen to represent locations where impacts from road traffic generated by the Proposed Development are likely to be the greatest i.e. as a result of development traffic at junctions. These locations are described in **Appendix F.4** and shown in **Figure 1.2**, Error! Reference source not found.F.7.
- 8.5.3 Concentrations have also been predicted at two diffusion tube monitoring sites located along Smithy Bridge Road and Halifax Road in order to verify the modelled results. **Appendix F.5** provides further details on the verification method.

Limit Values

- 8.5.4 The study area does not contain any predicted or measured exceedances of a limit values either in the existing year (2022) or in the future year (2025). The study area is not within a zone where DEFRA has reported an exceedance of a limit value either in the 'existing' baseline year (2022) or in future years.

LAQM

- 8.5.5 RBC, as part of the Greater Manchester Combined Authority (GMCA), has investigated air quality within its area as part of its responsibilities under the LAQM regime. To date, one AQMA (the Rochdale section of the GMCA AQMA) has been declared within RBC's administrative area. This AQMA was declared in 2016 at all locations across Greater Manchester where dispersion modelling showed NO₂ concentrations to be within 10% of the NO₂ annual mean NAQO (i.e. >36 µg/m³). The Hollingworth Road land parcel is not located within this AQMA, and the closest point of the AQMA is approximately 1.4 km west of the land parcel on the A58 Halifax Road.

Local Monitoring Data

RBC carries out monitoring at one automatic monitoring station, Rochdale Queensway, which is located 5.5 km southwest of the proposed development. The Council also deploys NO₂ diffusion tubes at a number of locations, including eighteen locations located within 6 km of the Hollingworth Road land parcel. NO₂ monitoring results for these monitoring locations between 2018 and 2022 are shown in Table 8.2.

- 8.5.6 Table 8.2 and Table 8.3 and their locations are shown in **Figure 1.3, Appendix F.7**. Whilst 2020 and 2021 monitoring results are presented, it should be noted that they are not considered to be representative due to Covid-19 restrictions in place during those years.

NO₂

Table 8.2 Measured Annual Mean NO₂ Concentrations 2018-2022

Site ID	Site Type	Within AQMA	Annual Mean (µg/m³)				
			2018	2019	2020	2021	2022
Automatic Site							
Rochdale Queensway	Roadside	Yes	-	-	-	28.5	27
Diffusion Tubes							
RO7ANO	Urban Background	Yes	32.3	32.1	25.2	27.7	26.4
RO8ANO	Roadside	Yes	45	44.7	33.6	36.6	36.3
RO9ANO	Kerbside	Yes	40.5	39.6	30.3	34.9	36.4
RO10ANO	Urban Background	Yes	18.7	17.7	14.8	14.9	15
RO12ANO ^a	Roadside	Yes	31.4	39.4	30.4	30.3	31
RO13ANO	Urban Background	No	13.7	17.2	14.1	15.1	19.9
RO14ANO	Rural	No	29.2	12.9	11.6	10.2	12.9
RO15ANO	Roadside	Yes	24.2	27	20.3	23	19.7
RO16ANO	Urban Background	Yes	22.6	19.9	18.8	18.3	19.5
RO17ANO	Urban Background	Yes	36.1	23.5	18.5	17.6	24.5
RO18ANO	Urban Background	No	31.1	26.8	20.9	18.7	22.7
RO19ANO	Roadside	No	27.2	35.8	29.3	35.4	-
RO22ANO	Roadside	Yes	28.6	43.4	31.5	32.7	32.2
RO23ANO	Roadside	No	-	37.8	27.6	31.4	31.7
RO26ANO	Roadside	Yes	-	41.6	31.1	32.5	34.2
RO27ANO	Roadside	Yes	-	46.1	32.7	28.8	31.3
RO28ANO ^a	Urban Background ^b	No	-	29.5	21.3	22.8	23.3
RO29ANO, RO30ANO, RO31ANO	Roadside	Yes	-	-	-	31.1	30.6
NAQO		40					

Exceedances of the NAQO are highlighted in bold.

2018 - 2022 data taken from the GMCA Air Quality Annual Status Report for 2022 (GMCA, 2023)

^a Used for model verification.

^b GMCA ASR for 2022 states that the Hollingworth Road land parcel type is 'urban background' however this site is representative of roadside conditions.

- 8.5.7 Measured concentrations at the closest monitoring location, RO28ANO, approximately 350 m west of the Hollingworth Road land parcel, have been well below the annual mean NAQO during the monitoring period presented. There were no exceedances of the annual mean NAQO at any remaining monitoring locations in 2022; however, there were exceedances of the NAQO at four sites (RO8ANO, RO22ANO, RO26ANO and RO27ANO) in 2019. Measured concentrations at all diffusion tube monitoring sites are below 60 µg/m³ across the past five years, indicating that it is unlikely that any exceedances of the 1-hour mean NAQO have occurred. In addition, there have been no measured exceedances of the 1-hour mean NAQO recorded at the Rochdale Queensway automatic monitor between since it began monitoring in 2021. There is a generally decreasing trend in concentrations over time, which is in accordance with national trends (Air Quality Consultants Ltd., 2022).

Table 8.3 Measured Exceedances of the Hourly Mean NO₂ Objective 2018-2022

Site ID	Number of Hours >200µg/m ³				
	2018	2019	2020	2021	2022
Rochdale Queensway	-	-	-	0	0
NAQO	18 (hours >200µg/m³)				

2018 – 2022 data taken from the GMCA Air Quality Annual Status Report for 2022 (GMCA, 2023)

PM₁₀ and PM_{2.5}

- 8.5.8 The results of the PM₁₀ and PM_{2.5} monitoring at the Rochdale Queensway site, which began monitoring in 2021, are shown in Table 8.4, Table 8.5 and Table 8.6.

Table 8.4 Measured Annual Mean PM₁₀ Concentrations 2018-2022.

Site ID	Annual Mean PM ₁₀ (µg/m ³)				
	2018	2019	2020	2021	2022
Rochdale Queensway	-	-	-	15.5	18
NAQO	40				

2018 – 2022 data taken from the GMCA Air Quality Annual Status Report for 2022 (GMCA, 2023)

Table 8.5 Measured Daily Mean PM₁₀ Concentrations 2018-2022.

Site ID	Number of Days >50µg/m ³				
	2018	2019	2020	2021	2022
Rochdale Queensway	-	-	-	0	6
NAQO	35 (days >50 µg/m³)				

2018 – 2022 data taken from the GMCA Air Quality Annual Status Report for 2022 (GMCA, 2023)

- 8.5.9 Measured PM₁₀ concentrations have been well below the relevant NAQOs and limit values for the duration of the monitoring period presented.

Table 8.6 Measured PM_{2.5} Concentrations 2018 – 2022.

Site ID	Annual Mean PM _{2.5} (µg/m ³)				
	2018	2019	2020	2021	2022
Rochdale Queensway	-	-	-	9.2	10
NAQO	20				

2018 – 2022 data taken from the GMCA Air Quality Annual Status Report for 2022 (GMCA, 2023)

- 8.5.10 Measured PM₁₀ and PM_{2.5} concentrations have been well below the relevant NAQOs for the duration of the monitoring period presented (for years data were available).

Predicted Background Concentrations

- 8.5.11 Estimated background concentrations for the Hollingworth Road land parcel have been obtained from the latest 2018-based national maps provided by DEFRA (DEFRA, 2020b). The DEFRA background concentrations for the land parcel, identified receptors and verification sites are provided in Table 8.7.
- 8.5.12 The background concentrations are all well below the relevant NAQOs both in the 'existing' and future years.

Table 8.7 Estimated Annual Mean Background Concentrations

Year	Location	Annual Mean ($\mu\text{g}/\text{m}^3$)		
		NO ₂	PM ₁₀	PM _{2.5}
2022	390_414 ^b	13.4	11.2	7.5
	391_413	13.1	11.3	7.6
	391_415	11.5	10.6	7.1
	392_412	13.1	11.2	7.5
	392_413	11.2	10.5	7.0
	392_414	10.3	10.1	6.7
	392_415 ^b	11.0	10.3	6.9
	392_416	9.7	9.8	6.6
	393_414	9.6	9.5	6.4
	393_415 ^a	9.6	9.8	6.5
	393_416	12.3	10.5	7.1
2025	390_414 ^b	12.1	10.9	7.3
	391_413	11.8	11.0	7.4
	391_415	10.3	10.3	6.9
	392_412	11.6	10.9	7.2
	392_413	10.0	10.3	6.8
	392_414	9.3	9.8	6.5
	392_415 ^b	9.9	10.0	6.7
	392_416	8.8	9.5	6.4
	393_414	8.6	9.3	6.2
	393_415 ^a	8.7	9.5	6.3
	393_416	11.2	10.3	6.9
NAQO		40	40	20

^a Location of Development Site.

^b Location of monitoring sites used for verification.

Note: Projections in the 2018 reference year background maps and associated tools are based on assumptions which were current before the Covid-19 outbreak in the UK. In consequence these tools do not reflect short- or longer-term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns.

Predicted Baseline and Future Baseline Concentrations

8.5.13 The ADMS-Roads model has been used to predict baseline NO₂, PM₁₀ and PM_{2.5} concentrations at each of the existing receptor locations identified in **Table 1.4.2, Appendix F.4**. The results for the baseline scenarios (2022 and 2025 without the proposed development) are presented in **Table 1.6.1, Appendix F.6**.

8.5.14 The annual mean NO₂, PM₁₀ and PM_{2.5} NAQOs are not predicted to be exceeded at any of the existing receptor locations in 2025; however, there are predicted exceedances of the annual mean NO₂ NAQO at four receptors (R19, R21, R23 and R56) in 2022. Predicted concentrations of NO₂ are less than 60 $\mu\text{g}/\text{m}^3$ at all receptors during 2022 and 2025, indicating that exceedances of the 1-hour mean NAQO are unlikely, and predicted concentrations of PM₁₀ are lower than 32 $\mu\text{g}/\text{m}^3$ during 2022 and 2025, indicating that exceedances of the 24-hour mean NAQO are also unlikely.

Baseline Evolution

- 8.5.15 Baseline concentrations of NO₂, PM₁₀ and PM_{2.5} are predicted to decrease between 2022 and 2025; the earliest possible year for first occupation. Vehicle emission factors and background concentrations are expected to improve over this period due to technological advances and national and international regulatory regimes including the uptake of Electric Vehicles (EV), despite general population growth leading to traffic increases on the road network.

8.6 Primary and Tertiary Mitigation

Primary Mitigation

Construction

- 8.6.1 A buffer has been included between the proposed developable areas within the Hollingworth Road land parcel and the Rochdale Canal Special Area of Conservation (SAC) / Site of Special Scientific Interest (SSSI). The buffer area of over 100 m will be used for public open space, and an attenuation basin. By increasing the distance between the SAC and construction activities, the risk of construction dust impacts on the SAC will be reduced.

Operation

- 8.6.2 A Framework Travel Plan has been prepared by Curtins, which aims to reduce the number of vehicle trips (and thereby vehicle emissions) generated by the proposed development. Some measures within the plan that are part of the design of the proposed development include:
- Safe walking and cycling routes passing through the Hollingworth Road land parcel, serving the proposed primary school, the Rochdale Canal and Hollingworth Lake.
 - Cycle parking will be provided within the curtilage of each dwelling.

Tertiary Mitigation

Construction

- 8.6.3 In accordance with Part 4 of the IAQM construction dust guidance, all Non-Road Mobile Machinery (NRMM) will need to adhere to the NRMM emissions standards for NO₂ and PM₁₀ outlined in European Directive 2016/1628.
- 8.6.4 The following standard mitigation measures from the IAQM guidance (IAQM, 2024) are recommended, taking into account the outcomes of the construction dust risk assessment (presented later in this chapter in Table 8.10Table 88.10). These mitigation measures will be included in a Construction Environmental Management Plan (CEMP) for the proposed development, subject to a suitably worded planning condition.

Table 8.8 Construction Phase Mitigation Measures

Category	Mitigation Measure
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 Hollingworth Road land parcel boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
Management	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real time PM ₁₀ continuous monitoring and/or visual inspections.
	Record all dust and air quality complaints, identify cause(s) and take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- of off-site, 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 Hollingworth Road land parcel 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 inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of the Hollingworth Road land parcel boundary, with cleaning to be provided if necessary.
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the local authority. Where possible, commence baseline monitoring at least three months before work on a phase commences.
Preparing and maintaining the site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the Hollingworth Road land parcel boundary that are at least as high as any stockpiles on-site.
	Fully enclose site or specific operations where there is a high potential for dust productions and the Hollingworth Road land parcel is 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 on-site. If they are being re-used on-site, cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
	Ensure all vehicles switch off engines when stationary – no idling vehicles.

Category	Mitigation Measure
Operating vehicle/machinery and sustainable travel	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 15 mph on surfaced roads and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car sharing).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the Hollingworth Road land parcel for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on-site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	Avoid bonfires and burning of waste materials.
Demolition	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.
	Bag and remove any biological debris or damp down such material before demolition.
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.
	Only remove the cover in small areas during work and not all at once.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
	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.
	For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

Category	Mitigation Measure
Trackout	Use water assisted dust sweepers on the Hollingworth Road land parcel access and local roads, to remove, as necessary, any material trackout out of the land parcel. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving the Hollingworth Road land parcel are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowzers and regularly cleaned.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Hollingworth Road land parcel where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Hollingworth Road land parcel exit, wherever site size and layout permits.
	Access gates to be located at least 10 m from receptors where possible.

Operation

- 8.6.5 The Framework Travel Plan includes targeted measures at the on-site primary school such as incorporating discussions on travel to encourage active travel to and from school. The Travel Plan will set out detailed goals at a later stage, and will be monitored by a Travel Plan Co-ordinator, appointed by Bloor Homes, to ensure these goals are being met over the longer term.

8.7 Assessment of Significant Likely Effects

Construction Dust Impacts

Screening Assessment

- 8.7.1 There are a number of existing sensitive human receptors located within 250 m of the Hollingworth Road land parcel boundary and within 50 m of the routes that will be used by demolition and construction vehicles. As such, further assessment of the risk of dust soiling and PM₁₀ emissions is required.
- 8.7.2 There is one sensitive ecological receptor, the Rochdale Canal SAC / SSSI, located within 50 m of the Hollingworth Road land parcel boundary. As such, further assessment of the risk of ecological impacts as a result of dust soiling and PM₁₀ emissions is required.

Further Assessment

- 8.7.3 The dust emissions magnitude of demolition, earthworks and construction activities and as a result of trackout have been determined in Table 8.9 based the criteria shown in Table 1.2.1, Appendix F.2.

Table 8.9 Dust Emissions Magnitudes

Activity	Magnitude	Justification
Demolition	Medium	The Hollingworth Road land parcel currently includes Heald Lane and industrial and commercial buildings along this road, which would be demolished to accommodate the proposed development. This demolition has the potential to exceed 12,000 m ³ of material, and it is possible that on-site crushing could be used as part of the demolition process. Demolition activities are not expected to occur more than 10 m above ground. Therefore, the dust emission magnitude of demolition activities is judged to be ' medium '.
Earthworks	Large	Proposed earthworks activities comprise clearance of vegetation, soil preparation and landscaping across an area greater than 110,000 m ² . The soil at the Hollingworth Road land parcel is largely classified as slowly permeable, seasonally wet, acid loamy and clayey soils (British Geological Survey, 2024) which are considered to be moderately dusty, particularly during periods of dry weather. Based on this, the dust emission magnitude of earthworks activities is judged to be ' large '.
Construction	Large	The total building volume to be constructed is expected to exceed 75,000 m ³ . Construction materials will comprise a mixture of masonry material including those with a high potential for dust release, such as concrete, as well as those with a lower dust potential such as metals and timber. Based on this, the dust emission magnitude of construction activities is judged to be ' large '.
Trackout	Large	The number of HDVs that will exit the Hollingworth Road land parcel will vary depending upon the processes occurring at any one time. It is likely that this number will exceed 50 on at least one day. Due to the nature of the Hollingworth Road land parcel, there could be an unpaved road length greater than 100 m in length comprising moderately dusty surface material. Based on this, the dust emission magnitude of trackout is judged to be ' large '.

Area Sensitivity

- 8.7.4 The area sensitivity to dust soiling, human health impacts and ecological impacts has been determined based on the criteria shown in **Table 1.2.3, Table 1.2.4 and Table 1.2.5, Appendix F.2**. The IAQM demolition and construction band criteria used to determine the sensitivity of the local area is shown in **Figure 1.4, Appendix F.7**.
- 8.7.5 Residential properties are classed as being 'high sensitivity' receptors to dust soiling, based on the IAQM guidance (IAQM, 2024) (see **Table 1.2.2, Appendix F.2**). There are more than ten residential properties located within 20 m of the Hollingworth Road land parcel boundary. As such, the sensitivity of the area surrounding the Hollingworth Road land parcel to dust soiling is judged to be 'high'.
- 8.7.6 The IAQM guidance states that trackout may occur for distance of up to 250 m from sites. As the demolition and construction traffic routing is currently yet to be determined with the project's transport consultants, Curtins, the worst-case assumption has been made that all main roads may potentially be used by HDVs leaving the Hollingworth Road land parcel entrances. There are more than ten residential properties located within 20 m of roads extending up to 250 m from the Hollingworth Road land parcel. As such, the sensitivity to dust soiling of the area surrounding roads along which material may be tracked is judged to be 'high'.
- 8.7.7 The IAQM also defines residential properties as being 'high sensitivity' receptors to human health impacts (see **Table 1.2.2, Appendix F.2**). PM₁₀ concentrations at existing residential properties within the study area are anticipated to be similar PM₁₀ concentrations predicted at existing receptor locations in close proximity to the Hollingworth Road land parcel (i.e. R01-R07) in 2022 (i.e. 11.2-14.9 µg/m³). There are between 10 and 100 sensitive receptors

within 20 m of the land parcel boundary, and roads along which material may be tracked. Based on these factors, the sensitivity to human health impacts of the areas surrounding the land parcel and the area surrounding roads along which material may be tracked are judged to be 'low'.

- 8.7.8 The IAQM guidance considers an ecological site with an international or national designation and the designated features may be affected by dust soiling to be a 'high sensitivity' receptor to dust deposition impacts. The Rochdale Canal SAC / SSSI is located approximately 5 m from the Hollingworth Road land parcel boundary (although there will be a buffer of at least 100 m between the ecological site and any demolition or construction activities) and approximately 150 m from roads along which material may be tracked. The sensitivity of the area surrounding the land parcel to dust soiling in relation to impacts on ecological sites is therefore judged to be 'high' and in relation to trackout, it is judged to be 'low'.

Risk of Impacts

- 8.7.9 The risk of construction dust impacts, without mitigation, has been defined based on the criteria shown in **Table 1.2.6, Appendix F.2** and is presented in Table 8.10Table 88.10.

Table 8.10 Risk of Construction Dust Impacts without Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	High Risk	High Risk	High Risk
Human Health	Low Risk	Low Risk	Low Risk	Low Risk
Ecology	Medium Risk	High Risk	High Risk	Low Risk

Demolition and Construction Road Traffic Emission Impacts

Screening Assessment

- 8.7.10 At present, detailed information regarding the construction methodology for the Proposed Development, specific activities and traffic movements is not yet known, as the principal contractor is yet to be appointed. However, measures to control and minimise the risk of adverse effects from construction activities will be contained within a CEMP. The CEMP will be submitted to RBC for its approval. The CEMP will consider HGV and other construction traffic movements, including details of routing and times of day of movements. HGV access will be prevented or minimised, where possible, on traffic sensitive roads, residential streets, congested roads or unsuitable junctions.
- 8.7.11 Vehicle movements associated with access, demolition and construction will vary through the construction programme, with short periods of peak HGV movements associated with demolition and the delivery of materials during the construction phase. However, when the HGV movements are averaged over a full year period (Annual Average Daily Traffic - AADT), these will be significantly lower than peak movements. Together with the implementation of best practice measures within the CEMP, the construction vehicle movements impacts on human health receptors in the area are considered to be temporary and not significant, and have therefore been scoped out of this assessment. Moreover, vehicle movements associated with construction are typically significantly lower than the number of vehicle movements associated with operation of the development, which have been taken into account in this assessment.

Site Suitability

Screening Assessment

- 8.7.12 The Hollingworth Road land parcel is adjacent to the busy B6225 Hollingworth Road, which has a baseline traffic flow of more than 10,000 AADT. Therefore, a more detailed assessment of site suitability has been undertaken.

Detailed Assessment

- 8.7.13 Predicted concentrations at modelled receptor locations within the Hollingworth Road land parcel are presented in Table 8.11. Details of the proposed receptors are provided in **Table 1.4.2, Appendix F.4** and shown in **Figure 1.2, Appendix F.7**.

Table 8.11 Predicted Concentrations within the Hollingworth Road land parcel

Receptor	Annual Mean (µg/m ³)		
	NO ₂	PM ₁₀	PM _{2.5}
PR1	12.3	10.7	7.0
PR2	12.2	10.7	7.0
PR3	14.3	11.4	7.3
PR4	14.9	11.6	7.4
NAQO	40	40	20

- 8.7.14 Predicted concentrations of NO₂, PM₁₀ and PM_{2.5} are well below the relevant NAQOs at all worst-case receptors, therefore, air quality within the application site, without mitigation, will be acceptable.

Operational Phase Road Traffic Emission Impacts

Screening Assessment

- 8.7.15 The Proposed Development will generate additional traffic during the operational phase, which will result in an increase of over 500 AADT along several roads, some of which are located within an AQMA, thus exceeding the EPUK / IAQM screening criteria (see **Appendix F.3**). As such, it is not possible to screen out the potential for significant impacts from operational traffic generated by the proposed development on existing sensitive receptors. Therefore, a detailed assessment has been undertaken as presented in the following section.
- 8.7.16 Regarding the Rochdale Canal SAC, for reasons stated in **Table 2.4 of Chapter 2: Biodiversity**, operational road traffic emission impacts on the SAC have been screened out as being 'not significant' and no further assessment has therefore been undertaken in this chapter.

Detailed Assessment

- 8.7.17 Predicted concentrations of NO₂, PM₁₀ and PM_{2.5} at existing receptors, both without and with the proposed development in place, are presented in **Table 1.6.2, Table 1.6.3 and Table 1.6.4 of Appendix F.6**. The 'without development' scenario predicted concentrations include background concentrations and emissions from existing traffic (including committed developments), and the 'with development' scenario predicted concentrations include

background concentrations, emissions from existing traffic (including committed developments) and traffic generated by the proposed development.

- 8.7.18 The predicted NO₂, PM₁₀ and PM_{2.5} concentrations in 2025 both without and with the Proposed Development in place, are below the relevant annual mean NAQOs at all existing sensitive human receptors in the study area. Furthermore, predicted annual mean NO₂ concentrations are below 60 µg/m³ at all existing receptors, indicating that exceedances of the 1-hour mean NO₂ NAQO are not likely, and the predicted annual mean PM₁₀ concentrations are below 32 µg/m³ at all existing receptors, indicating that exceedances of the 24-hour mean PM₁₀ NAQO are not likely.
- 8.7.19 The highest predicted annual average NO₂ contribution from the proposed development is predicted at receptor R03, a residential dwelling located at 115 Hollingworth Road, Littleborough. This receptor has a predicted 2025 NO₂ concentration of 23.1 µg/m³ without the development in place, and 24.7 µg/m³ with the predicted Proposed Development in place. The total NO₂ contribution at R03 is 1.6 µg/m³; 4% of the annual mean NAQO. This is classified as a 'negligible' impact in accordance with Table 8.1Table 88.1, which follows the EPUK / IAQM guidance.
- 8.7.20 The highest predicted annual mean NO₂ concentration with the Proposed Development in place is 34 µg/m³, or 85% of the annual mean NAQO, at receptor R56 which represents a residential dwelling located at 32 Bridge Street, Milnrow. This receptor has a predicted 2025 NO₂ concentration of 33.4 µg/m³ without the development in place. The predicted NO₂ contribution from the Proposed Development at receptor R56 is 0.6 µg/m³ (2% of the annual mean NAQO). This is classified as a 'slight adverse' impact in line with Table 8.1Table 88.1, which follows the EPUK/IAQM guidance.
- 8.7.21 The highest predicted annual average PM₁₀ contribution from the Proposed Development is predicted at receptor R03, a residential dwelling located at 115 Hollingworth Road, Littleborough. This receptor has a predicted 2025 PM₁₀ concentration of 14.7 µg/m³ without the development in place, and 15.4 µg/m³ with the development in place. The predicted Proposed Development PM₁₀ contribution at R03 is 0.6 µg/m³, or 1.6% of the annual mean NAQO. This is classified as a 'negligible' impact in line with Table 8.1Table 88.1, which follows the EPUK/IAQM guidance.
- 8.7.22 The highest predicted annual mean PM₁₀ concentration with the Proposed Development in place is 18.9 µg/m³, or 47.3% of the annual mean NAQO, at receptor R23 at 10 Wardle Road, Rochdale. This receptor has a predicted PM₁₀ concentration of 18.8 µg/m³ without the development in place, and the predicted PM₁₀ contribution from the Proposed Development is 0.12 µg/m³ (<0.5% of the annual mean NAQO). This is classified as a 'negligible' impact in line with Table 8.1Table 88.1, which follows the EPUK/IAQM guidance.
- 8.7.23 The highest annual average PM_{2.5} contribution from the Proposed Development is predicted at receptor R03, a residential dwelling located at 115 Hollingworth Road, Littleborough. This receptor has a predicted 2025 concentration of 9.1 µg/m³ without the development in place, and 9.4 µg/m³ with the Proposed Development in place. The predicted Proposed Development PM_{2.5} contribution at R02 is 0.3 µg/m³, or 1.7% of the annual mean NAQO. This is classified as a 'negligible' impact in line with Table 8.1Table 88.1, which follows the EPUK/IAQM guidance.
- 8.7.24 The highest predicted annual mean PM_{2.5} concentration with the Proposed Development in place is 11.4 µg/m³, or 57% of the annual mean NAQO, at receptor R23, which represents 10 Wardle Road, Rochdale. This receptor has a predicted 2025 PM_{2.5} concentration of 11.3 µg/m³ without the development in place. The predicted PM_{2.5} contribution from the Proposed Development at receptor R23 is <0.1 µg/m³. This is classified as a 'negligible' impact in line with Table 8.1Table 88.1, which follows the EPUK/IAQM guidance.

- 8.7.25 Overall, the impacts on predicted NO₂ concentrations are described as 'negligible' at 53 of the 56 existing sensitive receptors in accordance with the EPUK/IAQM guidance. For the remaining three, R49, R50 and R56, a 'slight adverse' impact on NO₂ concentrations is expected to occur. The impacts on predicted PM₁₀ and PM_{2.5} concentrations are described as 'negligible' at all existing receptor locations. As such, the effect of road traffic emissions associated with the operational phase of the Proposed Development on NO₂, PM₁₀ and PM_{2.5} concentrations is judged as 'not significant'.

8.8 Secondary Mitigation and Enhancement

Construction

- 8.8.1 No secondary mitigation for the construction phase is required.

Operation

- 8.8.2 The Framework Travel Plan contains measures such as information packs containing travel information relating to the development and local area, which will be distributed to residents of the development. The plan also includes the delivery of sessions to the on-site primary school to encourage active travel to and from school where possible, which is expected to have an impact on reducing car trips generated by the development.

8.9 Residual Effects

- 8.9.1 The residual effects are the same as those reported in previous sections and are considered to be 'not significant'.

8.10 Consideration of Climate Change

- 8.10.1 As ambient air quality is generally anticipated to improve throughout the UK in the coming decade, it is considered likely that the worst-case air quality impacts will occur in the short-term future, whilst adverse effects from climate change are anticipated to occur over a more medium to long-term timescale. This being the case, it is not considered that the combined effect of climate change and air quality will have the potential to result in greater impacts than have been identified within this chapter.
- 8.10.2 It should be noted that several of the mitigation measures identified to address air quality impacts associated with combustion emission (from transport and heating) are also likely to result in reductions in emissions of carbon dioxide, thus providing a benefit in terms of reducing the contribution of existing and proposed traffic to climate change.
- 8.10.3 In the longer term (2050-2080), changes in climate may affect the need for heating and cooling and, therefore, have an influence on the energy demand associated with the Proposed Development, but as the Proposed Development is heated primarily using electricity significant effects are not expected as a result.
- 8.10.4 The impact of the Proposed Development on climate change is addressed within **Chapter 11: Climate** of this ES.

8.11 Conclusions

Introduction

- 8.11.1 The air quality impacts associated with the Proposed Development been assessed.

- 8.11.2 RBC, as part of the GMCA, has investigated air quality within its area as part of its responsibilities under the LAQM regime. To date, one AQMA (the Rochdale section of the GMCA AQMA) has been declared within RBC's administrative area. This AQMA was declared in 2016 at all locations across Greater Manchester where dispersion modelling showed NO₂ concentrations to be within 10% of the NO₂ annual mean NAQO (i.e. >36 µg/m³). The Hollingworth Road land parcel is not located within this AQMA, and the closest point of the AQMA is approximately 1.4 km to the west on the A58 Halifax Road.

Demolition and Construction Effects

- 8.11.3 The construction works have the potential to create dust. During construction it is recommended that in accordance with the IAQM guidance a package of mitigation measures is put in place to minimise the risk of elevated PM₁₀ concentrations and dust nuisance in the surrounding area. With mitigation in place, the residual impacts from construction are judged as not significant.

Operational Effects

- 8.11.4 Concentrations of NO₂, PM₁₀ and PM_{2.5} have been predicted for a number of worst-case locations representing existing properties adjacent to the road network, as well as future receptor locations within the Hollingworth Road land parcel. Predicted concentrations are well below the relevant NAQOs at all of the existing and proposed receptor locations with the proposed development in place. The operational effects of the Proposed Development on air quality are judged to be 'not significant'. Concentrations within the land parcel itself are well below the NAQOs and therefore air quality within the land parcel will be acceptable for the proposed end-use.
- 8.11.5 Mitigation measures to reduce the operational impacts of the development on air quality concentrations are not required, but additional transport related mitigation measures contained within the Framework Travel Plan will be employed to reduce emissions from the proposed development.

Summary

- 8.11.6 Overall, the Proposed Development is considered to be in accordance with the requirements of the NPPF, and relevant local and national planning policy and guidance regarding air quality.

8.12 References

- Air Quality Consultants Ltd. (2022). 'Trends in UK NO_x and NO₂ Concentrations'. May 2022.
- Briary Energy (2023) 'Energy Strategy Statement. Bloor Homes: Littleborough – Hollingworth Road'. [Accessed 10/02/2024].
- British Geological Survey (2024). 'UK Soil Observatory (UKSO)'. Available at: <http://mapapps2.bgs.ac.uk/ukso/home.html> [Accessed 12/02/2024].
- Department for Environment, Food and Rural Affairs (DEFRA) (2018). 'UK Plan for tackling Roadside Nitrogen Dioxide Concentrations: Detailed Plan'. Available at: <https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017>
- Department for Environment, Food and Rural Affairs (DEFRA) (2019). 'Clean Air Strategy 2019'.

- Department for Environment, Food and Rural Affairs (DEFRA) (2020a) '*2020 NO₂ and PM Projections Data (2018 Reference Year)*' [online] Available at: <https://uk-air.defra.gov.uk/library/no2ten/2020-no2-pm-projections-from-2018-data>
- Department for Environment, Food and Rural Affairs (DEFRA) (2020b). '*2018 Based Background Maps*'.
- Department for Environment, Food and Rural Affairs (DEFRA) (2022). '*Local Air Quality Management Technical Guidance (TG22)*'. August 2022.
- Department for Environment, Food and Rural Affairs (DEFRA) (2023a). '*Environmental Improvement Plan 2023*'. Available at: <https://www.gov.uk/government/publications/environmental-improvement-plan>.
- Department for Environment, Food and Rural Affairs (DEFRA) (2023b). '*The Air Quality Strategy for England*'. Available at: <https://www.gov.uk/government/publications/the-air-quality-strategy-for-england>
- Department for Environment, Food and Rural Affairs (DEFRA) (2023c). '*Clean Air Strategy 2023*'
- Department for Environment, Food and Rural Affairs (DEFRA) (2023d). '*Emissions Factor Toolkit (Version 12.0.1)*' Online, available at: <https://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html>
- Department for Levelling Up, Housing and Communities (DLUHC) (2023). '*National Planning Policy Framework*'. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>
- Department for Levelling Up, Housing and Communities (DLUHC) and Ministry of Housing, Communities & Local Government (MHCLG) (2019). '*Planning Practice Guidance (PPG)*'. [Online] Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>
- Environmental Protection UK and the Institute of Air Quality Management (EPUK / IAQM) (2017). '*Land-use Planning & Development Control: Planning for Air Quality*'. V1.2. The Institute for Air Quality Management, London
- Greater Manchester Combined Authority (2016) *Air Quality Action Plan 2016 – 2021*. Available from: https://www.manchester.gov.uk/downloads/download/4166/air_quality_reports, [Accessed 14/02/2024].
- Greater Manchester Combined Authority (2016) *Greater Manchester Low-Emission Strategy*. Available from: <https://www.greatermanchester-ca.gov.uk/media/1276/low-emission-strategy-dec-2016.pdf> [Accessed 14/02/2024].
- Greater Manchester Combined Authority (2021a) *Greater Manchester Transport Strategy 2040*. Available from: https://www.tfgm.com/2040-transport-strategy?utm_source=redirect&utm_medium=referral&utm_campaign=2040. [Accessed 14/02/2024].
- Greater Manchester Combined Authority (2021b) *Greater Manchester Strategy 2021 – 2031*. Available from: <https://aboutgreatermanchester.com/media/jlsigbys/greater-manchester-strategy-our-plan.pdf> [Accessed 14/02/2024].
- Greater Manchester Combined Authority (2023) *Greater Manchester Clean Air Plan*. Available from: <https://cleanairgm.com/clean-air-plan/>. [Accessed 14/02/2024].

- Greater Manchester Combined Authority (2023) *2022 Air Quality Annual Status Report (ASR)*. Available from: <https://cleanairgm.com/data-hub/monitoring-reports/>. [Accessed 14/02/2024].
- Institute of Air Quality Management (2024) '*Guidance on the Assessment of Dust from Demolition and Construction v2.2*'. Available from: <https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf>. [Accessed 14/02/2024].
- Planning Practice Guidance (2014). '*Air Quality*'.
- Rochdale Borough Council (2014) *Rochdale Borough Transport Strategy. 2014 Refresh*. Available from: <https://www.rochdale.gov.uk/downloads/file/924/transport-strategy>. [Accessed 14/02/2024].
- Rochdale Borough Council (2016) *Core Strategy for the Local Plan*. Available from: <https://www.rochdale.gov.uk/downloads/file/405/core-strategy>. [Accessed 14/02/2024].
- Rochdale Borough Council (2022) *Rochdale Climate Change Strategy and Delivery Plan – a partnership approach (2021 – 2025)*. Available from: <https://www.rochdale.gov.uk/downloads/file/1120/climate-change-strategy-and-delivery-plan>. [Accessed 14/02/2024].
- Statutory Instrument 2000, No 921, '*The Air Quality (England) Regulations 2000*' HMSO, London.
- Statutory Instrument 2002, No 3034, '*The Air Quality (England) (Amendment) Regulations 2002*' HMSO, London.
- Statutory Instrument 2010, No. 1001, '*The Air Quality Standards Regulations 2010*' HMSO, London.
- Statutory Instrument 2016, No. 1184, '*The Air Quality Standards (Amendment) Regulations 2016*' HMSO, London.
- Statutory Instruments 2019, No. 74, '*The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019*' HMSO, London
- Statutory Instruments 2020, No. 131, '*The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020*' HMSO, London
- Statutory Instruments 2021, c. 30, '*Environment Act 2021*' HMSO, London
- Statutory Instruments 2023 No. 96. '*The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023*' HMSO, London

9 Noise and Vibration

9.1 Introduction

- 9.1.1 This chapter of the ES provides an assessment of the likely significant effects of noise and vibration associated with the Proposed Development. It describes and considers the potential for noise and vibration associated with the project, both direct and in direct, and the impact that it could have on both the Proposed Development receptors and the existing sensitive receptors within the surrounding area.
- 9.1.2 The chapter describes the methods used to assess the impacts, the baseline conditions currently existing at the Hollingworth Road land parcel and surrounding area, the potential direct and indirect impacts of the development arising from noise and vibration, the mitigation measures required to prevent, reduce, or offset impacts and details of the residual impacts.
- 9.1.3 This chapter has been prepared by the Acoustics Team at Stantec UK Limited, a sponsor member of the Institute of Acoustics (IOA) and a full member of Acoustics and Noise Consultants (ANC).
- 9.1.4 In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in **Volume 1**, Appendix D.

9.2 Policy Context, Legislation, Guidance and Standards

- 9.2.1 The following Policy, Legislation, Guidance and Standards have been used in this chapter. Full descriptions of each can be found within **Appendix G.1**.

Legislation

Control of Pollution Act

- 9.2.2 The Control of Pollution Act (CoPA) (Control of Pollution Act, 1974) covers a wide range of environmental pollution including noise. Parts of the Act have been superseded by the Environmental Protection Act (EPA) (Environmental Protection Act, 1990).

Environmental Protection Act

- 9.2.3 The Environmental Protection Act (EPA) (Environmental Protection Act, 1990) requires local authorities to investigate noise complaints from premises (land and buildings) and vehicles, machinery or equipment in the street. This includes noise arising from construction sites.

The National Planning Policy Framework (NPPF)

- 9.2.4 The revised National Planning Policy Framework (NPPF) (DLUHC, December 2023) and gives policy related to noise and the conservation of natural environment.

Noise Policy Statement for England (NPSE)

- 9.2.5 The Noise Policy Statement for England (NPSE) (Defra, March 2010) clarifies the underlying principles and aims of existing policy documents that relate to noise. It also sets out the long-term vision of Government noise policy which is: *“to promote good health and*

a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

Local Policy

Rochdale Adopted Core Strategy

- 9.2.6 With respect to noise, Policy G9 ‘Reducing the impact of pollution, contamination and land instability’ states:

“We will reduce all forms of pollution, contamination and land instability in the borough, by:

- a. Focusing on measures that reduce air pollution in Air Quality Management Areas, and other areas where pollution levels are unacceptable, particularly around motorways and main roads;*
- b. Requiring that development does not have impacts that lead to an unacceptable increase in air, water, noise, light or other pollution;*
- c. Ensuring sensitive new developments such as housing, schools and hospitals are not adversely affected by existing sources of pollution such as roads and certain types of industry...”*

- 9.2.7 Policy G9 goes on to state:

“Noise, including transport noise, is an increasing problem which can affect quality of life and health. Careful consideration of this should take place when new developments are being designed. Measures to reduce noise from new development and the impact of existing noise on new development could include planting buffers, noise barriers, banking, careful placement of traffic calming measures and careful consideration of building materials and road surfaces. The relationship between residential and non-residential developments must also be a key consideration, and if necessary limited hours of operation will be imposed through planning conditions or obligations.”

- 9.2.8 With respect to noise, Policy DM1 ‘General development requirements’ states:

“All development proposals, including changes of use of land and buildings, extensions and alterations, will be expected to demonstrate that they:

...change in

- d. Mitigate against any impacts due to noise, air, dust, light and odour pollution, traffic generation or inadequate access, where such mitigation is identified as being necessary;...”*

Building Regulations

Approved Document O Overheating

- 9.2.9 Approved Document O of the Building Regulations 2010 Overheating was published in December 2021 and took effect in England on 15 June 2022. It gives guidance on how to comply with Part O of the Building Regulations and applies to residential buildings only.

Guidance

Professional Practice Guidance on Planning and Noise

- 9.2.10 Professional Practice Guidance on Planning and Noise (ProPG) provides guidance on a recommended approach to the management of noise within the planning system in England.

Calculation for Road Traffic Noise

- 9.2.11 The Calculation of Road Traffic Noise (CRTN) (Department for Transport Welsh Office, 1988) describes the standard procedures for the measurement and calculation of traffic noise. It includes consideration of a number of factors including vehicle class, speed, road surface, distance attenuation and barrier attenuation.

Environmental Noise Guidelines for the European Region

- 9.2.12 The World Health Organization (WHO) 'Environmental Noise Guidelines for the European Region' (WHO, 2018) sets out guidance on suitable external noise levels from specific noise sources including road traffic railway, aircraft, wind turbine and leisure noise to inform policy makers.

Guidelines for Community Noise

- 9.2.13 The World Health Organization (WHO) 'Guidelines for Community Noise' (WHO, 1999) details guidance on suitable internal and external sound levels in and around residential properties.

Design Manual for Road and Bridges Design Manual for Road and Bridges LA 111 Traffic Noise and Vibration

- 9.2.14 The Design Manual for Roads and Bridges (DMRB, Rev2 2020) is considered to be the regulatory standard for the design of a new, or improvements to, a trunk road or motorway. Section LA 111 includes guidance on the assessment of noise and vibration.

Standards

British Standard 4142:2014 +A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound

- 9.2.15 BS 4142:2014+A1:2019 (The British Standards Institution, 2019) describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in the standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise

- 9.2.16 BS 5228-1:2009+A1:2014 (The British Standards Institution, 2014) gives recommendations for basic methods of noise control relating to construction sites, including sites where demolition, remediation, ground treatment or related civil engineering works are being carried out, and open sites, where work activities/operations generate significant noise levels, including industry-specific guidance.

BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration

- 9.2.17 BS 5228-2:2009+A1:2014 (The British Standards Institution, 2014) gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations generate significant vibration levels, including industry-specific guidance.

British Standard 7445:2003 ‘Description and Measurement of Environmental Noise – Part 1: Guide to Quantities and Procedures’

- 9.2.18 BS 7445-1:2003 (The British Standards Institution, 2003) describes methods and procedures for measuring noise from all sources which contribute to the total noise climate of a community environment, individually and in combination.

British Standard 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

- 9.2.19 BS 8233:2014 (The British Standards Institution, 2014) sets out guideline values in habitable rooms, such as living rooms and bedrooms which should not be exceeded.

9.3 Consultation

- 9.3.1 Consultation was undertaken with the environmental health officer from Rochdale Borough Council to seek agreement of the environmental sound survey methodology.
- 9.3.2 Consultation was also undertaken with the Rochdale Boroughwide Cultural Trust to understand the potential use of motorised boats from watercraft on Hollingworth Lake.

Table 9.1 Summary of Consultation

Consultation (Who and Date)	Summary of issues raised during consultation	How it has been dealt within this Chapter	Where it has been addressed within the chapter (if applicable)
Nathan Matley Head of Strategic Projects Your Trust Rochdale 01706 926601	Consultation on the type of watercraft used and if any internal combustion or jet engine powered watercraft are used on Hollingworth Lake	No powered watercraft are used on the lake so the assessment of lake activities has been scoped out of this chapter	Not Applicable
Paul Fletcher Environmental Health Specialist Lead Rochdale Borough Council 0170 6924163	Methodology of environmental sound and vibration survey	The survey methodology described within this chapter was agreed with the Council	Not Applicable

9.4 Methodology

Study Area

- 9.4.1 The assessment of noise and vibration impact considers potential effects comprising construction noise, construction vibration and operational noise.

9.4.2 The application site is split into two parcels known as the Hollingworth Road Land Parcel and the Rakewood Road Land Parcel.

9.4.3 The Hollingworth Road Land Parcel includes proposed residential housing and a school. The Rakewood Road Land Parcel is proposed for a public car park.

Construction Noise

9.4.4 The assessment of construction noise considers the closest receptor located within 300m of the closest construction activity.

9.4.5 The construction traffic study area includes those receptors within 50m from the kerb line of public roads with the potential for an increase in baseline noise level (BNL) of 1dBA or more as a result of the construction traffic.

Construction Vibration

9.4.6 The assessment of construction vibration considers the closest receptor located within 100m of the closest construction activity.

Operational Road Traffic Noise

9.4.7 The study area for operational road traffic noise impact considers receptors:

- within the Proposed Development;
- within 50m of existing road links with potential to experience a short-term BNL change of more than 1dBA as a result of the Proposed Development; and
- within 600m of new road links or road links physically changed or bypassed by the project.

9.4.8 The change in traffic flows has been assessed along links included in the traffic model prepared by the project's Transport Consultants, Curtins.

Receptor Sensitivity

9.4.9 The sensitivity of receptor varies depending on the nature of the receptor with residential dwellings deemed to have a higher sensitivity than those of commercial or industrial use.

Receptors

9.4.10 The location of the identified noise sensitive receptors are detailed in **Table 9.2** and **Figure 1.2 in Appendix G.2**

Table 9.2 Descriptions of Noise Sensitive Receptors

Receptor ID	Receptor Type (Existing or Proposed)	Description	Receptor Sensitivity
1	Existing	Residential Dwelling No 123 Brown Lodge Drive	High
2	Existing	Residential Dwelling No 17 Lincoln Drive	High
3	Existing	Residential Dwelling No 11 Bank Close	High

Receptor ID	Receptor Type (Existing or Proposed)	Description	Receptor Sensitivity
4	Existing	Residential Dwelling No 1 Heald Lane	High
5	Existing	Residential Dwelling No 85 Hollingworth Road	High
6	Proposed	Residential housing 50 m from construction works	High
7	Proposed	Residential housing 100 m from construction work	High

Baseline Data Collection

Unattended Environmental Sound Survey

- 9.4.11 An unattended environmental sound survey was undertaken at four locations between approximately 11:00 hours on Thursday 11 September 2023 and 13:00 hours on Friday 12 September 2023, to determine the existing sound climate at the Hollingworth Road land parcel.
- 9.4.12 Measurements of the L_{Aeq} , L_{A90} , and L_{AFMax} sound levels were logged in 15-minute intervals. The sound level meters were located in environmental cases. The microphones were connected to the meters via an extension cable and fitted with the manufacturer's windshield.

Attended Environmental Sound and Vibration Survey

- 9.4.13 An attended sound and vibration survey was conducted on Thursday 11 September 2023 between 13:45 and 14:45 to monitor passing train noise and vibration from the railway at a location considered representative of the proposed future dwelling facades to the north of the Proposed Development near the trainline. Measurements were also undertaken of individual train pass-bys.
- 9.4.14 The W_d weighted Vibration Dose Value (VDV) was measured in the X and Y axis and the W_b weighted VDV was measured in the Z axis over 30-second intervals.
- 9.4.15 The accelerometer was attached to a DIN plate and placed on the ground. The vibration level meter was located in an environmental case with the accelerometer connected to the meter via an extension cable.

Instrumentation

- 9.4.16 The instrumentation used in the survey (including calibration information) is listed in ES Volume 2, **Appendix G, Table A14.11**. Field calibrations were performed before and after the measurements with no significant fluctuations recorded (< 0.5 dB). Calibration certificates are available upon request.

Measurement Locations

- 9.4.17 Sound measurements were undertaken at four positions at the Hollingworth Road land parcel, considered representative of the sound levels incident on the future development and conditions at nearby noise sensitive receptors. The measurement positions are detailed in **Figure 1.1** in **Appendix G.2** and described in **Table 9.3**.

Table 9.3 Description of Measurement Locations

Position	Description
LT1	Located at the southwest corner of the existing residential dwelling within the operational farm buildings on the Hollingworth Road land parcel. The meter was placed in an environmental case and placed on a brick wall in free field conditions with the microphone at a height of approximately 2.8 m.
LT2	The microphone was located at the northern part of the Hollingworth Road land parcel approximately 110 m from the edge of the railway tracks to the north of the land parcel boundary. The meter was placed in an environmental case and placed on the ground in free field conditions with the microphone at a height of approximately 1.5 m.
LT3	The microphone was located at the northern part of the land parcel approximately 125 m from the edge of Hollingworth Road which is located to the east of the land parcel boundary. The meter was placed in an environmental case and placed on the ground in free field conditions with the microphone at a height of approximately 1.5 m.
LT4	The microphone was located at the southwest corner of the Hollingworth Road land parcel approximately 25 m from the edge of Lank Bank which borders the south of the land parcel boundary. The meter was placed in an environmental case and placed on the ground in free field conditions with the microphone at a height of approximately 1.5 m.
V1	The vibration meter was located at the northern parcel of the Hollingworth Road land parcel approximately 110 m from the edge of the railway tracks to the north of the land parcel boundary.

Meteorological Conditions

- 9.4.18 Based on observations and on-site measurements, the meteorological conditions during the survey are detailed in **Table 9.4**.

Table 9.4 Meteorological Conditions

Description	Date	
	11/09/2023	12/09/2024
Temperature (°C)	19	17
Precipitation (mm)	0	< 1.0
Cloud Cover (%)	80	100
Wind Speed (m/s)	1.5 – 3.0	0.5 – 1.5
Wind Direction	Northeast	West

Environmental Sound Climate

- 9.4.19 Due to the nature of the sound survey (i.e., unattended) it is not possible to accurately comment on the dominant noise sources or specific noise events during the entire survey period. However, the dominant noise sources noted at each measurement position at the start and end of the survey are described in **Table 9.5**.

Table 9.5 Dominant Noise Sources

Position	Dominant Noise Sources
LT1	Distant traffic from the surrounding road network dominated the noise climate the measurement position.
LT2	Noise from trains on the nearby railway line to the north was dominant when passing. Road traffic noise on the local road network was dominant when no trains were passing. Secondary noise sources of people conversing on the canal tow path could be heard.
LT3	Noise was dominated by the operational construction site to the north of the Hollingworth Road land parcel boundary. When no noises were present from the construction site the road traffic noise from Hollingworth Road dominated the noise climate. Secondary noises from distance farming vehicles and traffic could be heard.
LT4	Noise was dominated by Lake Bank to the south of the Hollingworth Road land parcel boundary. Secondary noises from distant traffic and birdsong.

- 9.4.20 During their time on-site, the engineer did not consider natural sound sources (e.g., tree leaves or grass rustling in the wind, birdsong, sound from water flow etc.) to have a significant impact on the overall measured sound level at the measurement locations.
- 9.4.21 Due to the construction works at the Hollingworth Road land parcel boundary at LT3 the daytime measurements when construction works were taking place have been omitted from this assessment.

Assessment

- 9.4.22 This section summarises the approach that has been adopted to apply noise and vibration related legislation, planning policy and industry standard guidance to this assessment.

Potential Magnitude of Impacts in Terms of Noise and Vibration

- 9.4.23 Based on the IEMA Guidelines for Environmental Noise Assessment and relevant guidance, the relationship between the magnitude of the noise impact, noise effect, and significance is described in **Table 9.6**.

Table 9.6 Noise Exposure Hierarchy and Effect Levels

Magnitude (Nature of Impact)	Response	Description of Effect (on a specific receptor)	Significance
Major Beneficial	Very Noticeable Improvement	Causes a material change in behaviour and/or attitude, e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.	More likely to be Significant
Moderate Beneficial	Noticeable Improvement	Improved noise climate resulting in small changes in behaviour and/or attitude, e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the areas such that there is a perceived change in the quality of life.	Less likely to be Significant
Minor Beneficial	Just Noticeable Improvement	Noise impact can be heard but does not result in any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.	
Negligible	No Response	N/A = No discernible effect on the receptor	Not Significant

Magnitude (Nature of Impact)	Response	Description of Effect (on a specific receptor)	Significance
Minor Adverse	Present and Not Intrusive	Noise impact can be heard, but does not cause any change in behaviour or attitude, e.g. turning up the volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life	Less likely to be Significant
Moderate Adverse	Present and Intrusive	Noise impact can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance. Affects the character of the area such that there is a perceived change in the quality of life.	More likely to be Significant
Major Adverse	Present and Disruptive	Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area.	
Substantial Adverse	Very Disruptive and Harmful	Significant changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Significant

- 9.4.24 The impact of the Proposed Development in noise and vibration terms has also been assessed with consideration to the proposed LOAELs and SOAELs based on the guidance set out in the PPG and other relevant policy and standards.

Likely Significant Effects in EIA Terms

- 9.4.25 The approach to assessing and assigning significance to an environmental effect has relied upon the context of the results of the assessment undertaken in noise and vibration terms.
- 9.4.26 Effects that are described as 'minor' or 'negligible' in EIA terms are generally determined to be 'not significant', and effects that are described as 'moderate' or 'major' in EIA terms are determined to be 'significant' in the context of the EIA Regulations. Minor effects may constitute a significant impact, but only where the receptor sensitivity is very high.
- 9.4.27 The level of effects and significance in EIA terms has been determined based on the results of the assessments and is discussed further below.

Construction Noise

- 9.4.28 BS 5228:2009+A1:2014 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' does not provide specific limits for construction noise, but it does define methods of assessing the significance. The standard also provides information on construction noise and vibration reduction measures promoting a 'Best Practice Means' approach to control noise and vibration. A method for determining the sound levels associated with construction activities is also detailed and considers the numbers and types of equipment operating, their associated Sound Power Level (Lw), and the distance to receptors, along with the effects of any screening.

- 9.4.29 Based on the guidance detailed in table E.1 of BS 5228:2009+A1:2014, **Table 9.7** below defines the threshold of potential significant effects at dwellings.

Table 9.7 Threshold of Potential Significant Effect at Dwellings

Assessment Category and Threshold Value Period	Threshold Value in dB ($L_{Aeq, T}$)		
	Category A ^A	Category B ^B	Category C ^C
Night-time (23:00 – 07:00)	45	50	55
Evenings and Weekends ^D	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Note 1 – A potential significant effect is indicated if the $L_{Aeq, T}$ noise level arising from the Hollingworth Road land parcel exceeds the threshold level for the category appropriate to the ambient noise level. Note 2 – If the ambient noise level exceeds the Category C threshold values given in the table (i.e., the ambient noise levels is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq, T}$ noise level for the period increase by more than 3 dB due to site noise. Note 3 – Applied to residential receptors only. ^ACategory A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values. ^BCategory B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values. ^CCategory C: Threshold values to use when the ambient noise levels (when round to the nearest 5 dB) are higher than category A values. ^D19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays			

- 9.4.30 With reference to BS5228, normal construction hours are Monday to Friday between 07:00 to 19:00 and Saturday 08:00 to 13:00. For assessment purposes it is assumed no construction work will take place on Sundays or Bank Holidays.
- 9.4.31 As this is a high-level assessment, the calculations have been based on normal construction hours. If there is a requirement to work outside of these hours, this will be controlled through the Section 61 CoPA prior approval process. This will be based on the specific construction activities that are required for evening and/or night-time periods.
- 9.4.32 **Table 9.8** defines the construction noise adverse impact levels for residential buildings.

Table 9.8 Construction Noise Impact Levels for Residential Buildings

Magnitude of Impact in Noise Terms	Construction Sound Level $L_{Aeq, T}$ (dB) at Residential Receptor
Major	Above or equal to the Threshold Level* + 5 dB
Moderate	Above or equal to the Threshold Level* and below the Threshold Level* + 5 dB
SOAEL	
Minor	Above or equal to the Ambient Sound Level and below the Threshold Level*
LOAEL	
Negligible	Below the Ambient Sound Level
*Threshold level determined as per BS 5228:1 Section E3.2 and Table E.1	

- 9.4.33 Construction noise is considered to be a significant effect where it is determined that a substantial, major or moderate magnitude of noise impact will occur for a duration exceeding:

- 10 or more days or nights in any 15 consecutive days or nights;
- a total number of days exceeding 40 in any 6 consecutive months;
- Construction Vibration

9.4.34 The effects of human response to whole body vibration in buildings are defined in BS 6472-1: 2008 in terms of Vibration Dose Value (VDV). However, for human response to construction-related vibration, it is considered more appropriate to use the Peak Particle Velocity (PPV) measure, as suggested in BS 5228-2:2009+ A1:2014 Code of practice for noise and vibration control on construction and open sites (BSI, 2014). Part 2: Vibration.

9.4.35 The limit of human perception to vibration is between approximately 0.15 mm/s and 0.3 mm/s PPV. The sensitivity of the human body also varies according to different frequencies of vibration, with perception generally possible between 1 Hz to 80 Hz.

9.4.36 Based on the above guidance **Table 9.9** details the proposed assessment criteria.

Table 9.9 Construction Vibration Impact Levels

Magnitude of Impact in Vibration Terms	Vibration Level PPV mm/s	Description of Effects
Major	> 10	Vibration is likely to be intolerable for any more than a very brief exposure.
Moderate	1 to 10	Increasing likelihood of complaint in residential environments but can be tolerated at the lower end of the scale if prior warning and explanation has been given to residents.
SOAEL		
Minor	0.3 to 1	Increasing likelihood of perceptible vibration in residential environments.
LOAEL		
Negligible	< 0.3	Vibration is unlikely to be perceptible in even the most sensitive situations for most vibration frequencies associated with construction.

9.4.37 Table B.2 of BS 5228-2:2009+A1:2014 provides guidance on PPV vibration limits for transient excitation for different building types. **Table 9.10** outlines the transient vibration guide values for cosmetic damage to buildings. Consideration will be given to the guideline values detailed in **Table 9.10** in determining the significance of construction vibration.

Table 9.10 Transient Vibration Guide Values for Cosmetic Damage

Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or Framed Structures. Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	
Un-reinforced or light framed structures. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
Note 1 Values referred to are at the base of the building. Note 2 At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.		

9.4.38 In addition to the above, section 3.19 of DMRB states that construction vibration shall constitute a significant effect in EIA terms where it is determined that a substantial, major or moderate magnitude of impact will occur for a duration exceeding:

- 10 or more days or nights in any 15 consecutive days or nights.
- A total number of days exceeding 40 in any six consecutive months.

Operational Internal and External Noise Levels for Proposed Residential Receptors

9.4.39 Internal and external noise levels for proposed receptors have been assessed with reference to the criteria detailed in BS 8233.

9.4.40 The proposed internal and external noise criteria are presented in **Table 9.11**.

Table 9.11 Internal and External Noise Criteria for Habitable Rooms Due to Transportation Noise

Level	Proposed LOAEL and SOAEL Levels for Transportation Noise Affecting New Residential Premises	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
Internal Noise Levels		
LOAEL	35 dB LAeq, 16 hr	30 dB LAeq, 8 hr 45 dB LAmax 10-15 times per night
SOAEL	50 dB LAeq, 16 hr	45 dB LAeq, 8 hr 65 dB LAmax if more than 20 events 80 dB LAmax if less than 20 events
External Amenity Areas (Free Field Levels)		
LOAEL	50-55 dB LAeq, 16 hr	-
SOAEL	65 dB LAeq, 16 hr	-

9.4.41 It is assumed that outdoor incident noise levels in external areas used for amenity (i.e., gardens/balconies) are only of concern during the daytime hours, as people are unlikely to make frequent use of the outdoor amenity areas during night-time hours.

9.4.42 The assessment of potential noise impact when windows are open to control overheating will be based on Approved Document O assessment criteria presented in **Table 9.12**.

Table 9.12 Proposed Internal Ambient Noise Criteria – Overheating Condition

Internal Ambient Noise Criteria – Night-time (07:00 – 23:00)
40 dB LAeq, 8hour 55 dB LAmax - not to be exceeded more than 10 times a night

Operational Vibration Levels for Proposed Residential Receptors

9.4.43 The assessment of potential impact from the railway line to the east of the Hollingworth Road land parcel boundary upon the Proposed Development during the operational stage is based on the guidance set out in BS 6472-1:2008 'Guide to Evaluation of Human Exposure to Vibration From Buildings – Part 1: Vibration Sources Other Than Blasting'. Based on this standard, the assessment criteria in **Table 9.13** are proposed.

Table 9.13 Proposed Vibration Assessment Criteria

Adverse Effect Level	Vibration Dose Value $\text{ms}^{-1.75}$	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
LOAEL	0.2	0.1
SOAEL	0.8	0.4

Operational Road Traffic Noise Affecting Existing Receptors

- 9.4.44 Operational road traffic noise impacts have been assessed in accordance with the guidance outlined in DMRB LA 111, implementing the calculation methodology of the CRTN.
- 9.4.45 DMRB LA 111 provides a classification for the magnitude of change in road traffic noise. **Table 9.14** below presents the magnitude of impact in noise terms to assess the full and permanent effects of the Proposed Development.

Table 9.14 Magnitude of Change in Noise Terms

Magnitude of Impact in Noise Terms	Change in Noise Levels at Noise Sensitive Receptor (dB LA10,18h, or Lnight)
Major	≥ 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	< 1.0

Operational External Noise Levels for Proposed Primary School

- 9.4.46 The guidance stated in Building Bulletin 93 (BB93) and Acoustics of Schools: A Design Guide, sets out criteria in terms of $L_{Aeq,30min}$. Due to the assessment methodology (i.e., based on traffic data), it is not possible to calculate the future $L_{Aeq,30min}$ levels. An assessment has therefore been undertaken based on the $L_{Aeq,16hr}$ sound levels as calculated by the acoustic model. This assessment should be considered indicative to establish whether the principle of the education facilities in the proposed location is acceptable.

Table 9.15 details the proposed LOAEL and SOAEL criteria for school sites.

Table 9.15 School LOAEL and SOAEL Criteria

Adverse Effect Level	External Ambient Noise Level $L_{Aeq,16hr}$ dB
SOAEL	70
LOAEL	60

Limitations

Baseline Sound Survey

- 9.4.47 The surveying acoustic engineer noticed nothing unusual in terms of the sound climate at the time of the survey and the conditions were considered to be representative of typical conditions at the survey positions. This report refers, within the limitations stated, to the environment of the Hollingworth Road land parcel in the context of the surrounding area at the time of the inspections. Conditions are considered likely to be representative and to provide a suitable basis for the assessment. Environmental conditions can vary. No

warranty is given as to the possibility of change to the acoustic environment of the Hollingworth Road land parcel or surrounding area at differing times.

Construction Noise Assessment

- 9.4.48 BS 5228:2009 Annex E (Informative) states that noise predictions should be undertaken to determine eligibility for noise insulation or temporary re-housing. However, the informative also states that these assessments should be undertaken when a contractor has been appointed and detailed method statements on the construction programme and plant to be used are available.
- 9.4.49 The details of the types of construction methods and plant likely to be used during the construction phases are yet to be finalised. Therefore, at this stage in the scheme's design, it is not possible to state precisely where the plant will operate and for how long during the working day. However reasonable assumptions have been made to inform the assessment of construction noise presented in this assessment.

9.5 Baseline Conditions

The Hollingworth Road land parcel and Surrounding Area

Sound Survey Results

- 9.5.1 A summary of the unattended sound survey results is presented in **Table 9.16**. Time-history graphs detailing the full results of the unattended sound survey are contained in **Appendix G.3**.

Table 9.16 Summary of Environmental Sound Survey Results

Position	Period, T	Environmental Sound Levels		
		dB LAeq,T	Typical dB LA _F Max*	Typical dB LA90**
LT1	Daytime (07:00 to 23:00)	48	-	40
	Night-time (23:00 to 07:00)	44	54	38
LT2	Daytime (07:00 to 23:00)	52	-	41
	Night-time (23:00 to 07:00)	49	71	36
LT3	Daytime (07:00 to 23:00)	53***	-	39***
	Night-time (23:00 to 07:00)	44	60	32
LT4	Daytime (07:00 to 23:00)	53	-	43
	Night-time (23:00 to 07:00)	50	64	41

* Based on the 10th highest measured LA_Fmax level.

** Calculated based on the statistical distribution of background sound levels during the measurement period in general accordance with guidance in BS 4142:2014+A1:2019

*** Excludes periods when construction works were taking place on the adjacent site to the north.

Vibration Survey Results

- 9.5.2 The Manchester to Leeds Trans-Pennines railway is situated along the northern perimeter of the Proposed Development, with a canal situated between the Hollingworth Road land parcel boundary and the railway line. A vibration survey was conducted at the land parcel for approximately one hour, to obtain existing vibration levels. The vibration meter was set up at a distance of approximately 100m away from the trainline.
- 9.5.3 A summary of VDV levels are presented in **Table 9.17**. The full VDV time-history results of the environmental vibration survey are shown in **Figure A14.9 in Appendix G**

Table 9.17 Vibration Survey Results

Axis	Vibration Dose Value (VDV) ($\text{ms}^{-1.75}$)
	Daytime (1 hour)
X	< 0.001
Y	< 0.001
Z	< 0.002

Baseline Evolution

- 9.5.4 The evolution of the baseline has been considered by using the acoustic model to calculate future sound levels on both the Hollingworth Road land parcel and at nearby receptors. The modelled future baseline scenario is based on traffic data provided for the future baseline scenario.
- 9.5.5 Approved developments are factored into the future years traffic data, and therefore the assessment of likely significant cumulative effects with these developments is inherent to the assessment and has not been reported separately.
- 9.5.6 A review of the data shows that baseline flows for road links adjacent to the Development are likely to increase. However, the increase is unlikely to be perceptible in noise terms with noise levels increasing by less than 0.5 dB at all assessed road links.

9.6 Primary and Tertiary Mitigation

Tertiary Mitigation

Construction

- 9.6.1 The following advice is based on the guidance provided in BS5228-1:2009+A1:2014 and will be applied as appropriate to minimise the noise breakout from the construction activities affecting noise sensitive receptors. They will be incorporated into the detailed CEMP, to be secured by a suitably worded planning condition.
- Use of quiet working methods, the most suitable plant and reasonable hours of working for noisy operations, where reasonably practicable;
 - Locating noisy plant and equipment as far away from dwellings as reasonably possible, and where practical, carry out loading and unloading in these areas;
 - Screening plant to reduce noise which cannot be reduced by increasing the distance between the source and the receiver (i.e., by installing noisy plant and equipment behind large site buildings);
 - Shutting down any machines that work intermittently or throttling them back to a minimum;
 - Orientating plant that is known to emit noise strongly in one direction so that the noise is directed away from houses, where possible;
 - Closing acoustic covers to engines when they are in use or idling;
 - Lowering materials slowly, whenever practicable, and not dropping them;
 - Use of temporary acoustic barriers, where appropriate, and other noise containment measures, such as screens, sheeting and acoustic hoardings at the construction site

boundary to minimise noise breakout and reduce noise levels at the potentially affected receptors; and

- Use of rotary augured piles rather than driven, where technically possible and likely to impact receptors.

9.6.2 In addition to the above, all reasonable steps will be taken to keep the local community informed of proposed construction operations. Measures for community liaison will be dealt with by a Community Liaison Officer to co-ordinate the dissemination of information (for example, by means of a regular newsletter) proposed and to programme those operations at time that would minimise the potential for disturbance.

9.6.3 The above range of environmental management controls represent measures that are regularly and successfully applied to large-scale construction projects in order to minimise noise and vibration effects on local communities. The application of similar control measures during the construction phases would likewise support that the works proceed with minimum disturbance to local residents.

9.7 Assessment of Significant Likely Effects

Construction Phase

Construction Noise

Rakewood Road Land Parcel

9.7.1 The Rakewood Road Land Parcel land that is proposed for a public car park. The nearest existing receptor is the RSPCA animal rescue centre and attached café, approximately 35 m from the Application Site boundary. Both these receptors are deemed to be of medium sensitivity.

9.7.2 The construction activities associated with the above are likely to be undertaken over a short-term timescale. Furthermore, based on the proposed phasing, demolition and construction activities throughout the Application Site would not occur simultaneously and across the entire land parcel or on the boundary at the same time.

9.7.3 For the reasons stated above and due to the medium sensitivity of the receptor, noise associated with the construction of the car park is not likely to be significant and has been scoped out of the assessment for the Rakewood Road Land Parcel.

Hollingworth Road Land Parcel

9.7.4 Construction noise could potentially increase the ambient noise levels at existing noise-sensitive receptors and proposed noise-sensitive receptors if already inhabited during the construction works.

9.7.5 Precise details of the types of construction methods and plant are still to be determined; however, the assessment considers construction activities during the following principal stages.

- Site preparation works;
- Demolition, foundations and substructure works;
- Building erection and superstructure works; and
- Road works.

- 9.7.6 Internal building construction, and the servicing and fitting out of new buildings is normally not a significant source of noise or vibration and is not considered further.
- 9.7.7 An assessment of construction noise at each receptor has been undertaken, based on typical plant noise level data contained within Annex C of BS 52881:2009+A1:2014.
- 9.7.8 For the purposes of the construction noise assessment, **Table 9.18** details the calculated ambient noise levels at the identified receptors and the associated threshold level determined in accordance BS5228:1 Section E3.2 and Table E.1.
- 9.7.9 Due to limitations in the acoustic model calculation of the ambient noise level, it is not possible to calculate the 10-hour L_{Aeq} for direct comparison with the threshold levels detailed in BS5228. The calculated 16-hour L_{Aeq} therefore forms the basis of the assessment. It is not expected that this would significantly affect the results of the assessment, as the presented $L_{Aeq,16h}$ are expected to be lower than the $L_{Aeq,10h}$.
- 9.7.10 **Table 9.18** shows the measurement position used to represent the ambient sound levels at each receptor, which in turn shows the threshold value for the construction noise assessment for each receptor.

Table 9.18 Ambient Sound Levels at Receptors

Receptor	Measurement Position Used	Ambient Noise Level dB, (L_{Aeq} , T hours)	Threshold value (dB, L_{Aeq} , T hours)
1	LT2	52	65
2	LT2	52	65
3	LT1	49	65
4	LT1	49	65
5	LT4	52	65
6	LT1	49	65
7	LT1	49	65

- 9.7.11 **Table 9.19** details the results of the assessment for typical construction activities, calculated as the dB $L_{Aeq,10h}$ to the noise sensitive receptors.

Table 9.19 Construction Noise Levels

Receptor	Calculated Construction Noise Level (dB $L_{Aeq,10h}$) at Noise Sensitive Receptor			
	Site Preparation Works	Demolition, Foundations and Substructure Works	Building Erection and Superstructure Works	Road Works
1	77	63	64	68
2	82	77	79	76
3	87	83	84	74
4	81	77	78	70
5	75	71	72	76
6	73	69	70	74
7	67	63	64	68

- 9.7.12 With reference to the criteria detailed in **Table 9.8**, **Table 9.20** details the likely impact in noise terms of each construction stage at the assessment receptors.

Table 9.20 Assessment of Impact for Construction Activity Noise

Receptor	Calculated Construction Noise Level (dB L _{Aeq,10h}) at Noise Sensitive Receptor			
	Site Preparation Works	Demolition, Foundations and Substructure Works	Building Erection and Superstructure Works	Road Works
1	Major	Minor	Minor	Moderate
2	Major	Major	Major	Major
3	Major	Major	Major	Major
4	Major	Major	Major	Moderate
5	Major	Major	Major	Major
6	Major	Moderate	Major	Major
7	Moderate	Minor	Minor	Moderate

- 9.7.13 The assessment is based on a worst-case scenario with activities occurring at the closest location to the receptors. The receptors have also need selected which are situated immediately next to the Hollingworth Road land parcel boundary. However, construction noise is unlikely to be continuous in one fixed place for the whole duration of construction. In practice, there will be large periods where works are occurring at greater distances (i.e., not immediately adjacent to this receptor) where the impact magnitude is likely to be lower and consequently result in an effect of lower significance.
- 9.7.14 The above numerical assessment does not consider the implementation of a CEMP as at this stage it is not possible to attribute a numerical reduction in sound level to any of the specific construction activities. However, with the implementation of a CEMP, the effects of construction noise are likely to reduce to be minor temporary, short term and not significant. Further assessment of construction noise and vibration mitigation may be required as appropriate when detailed method statements and construction programme and phasing are available.

Construction Traffic

- 9.7.15 At this stage it is not possible to determine the volume of construction traffic that would be generated during the course of a normal working day. However, a CEMP will outline measures to control and minimise the risk of adverse effects from construction activities. The CEMP will be submitted to RBC for their approval. The CEMP will consider Heavy Goods Vehicles (HGV) and other construction traffic movements, including details of routing and times of day of movements. HGV access will be prevented or minimised, where possible, on traffic sensitive roads, residential streets, congested roads or unsuitable junctions.
- 9.7.16 There are appropriate haul routing options for construction traffic (HGVs) to access the Proposed Development with minimal impact and disruption on the surrounding highway network; namely along Smithy Bridge Road, Lake Bank and Hollingworth Road (B6225), avoiding the more sensitive routes. A construction traffic management plan will also be prepared to reduce the impact of staff travel to and from the Hollingworth Road land parcel during construction. This should be secured with a suitably worded planning condition.
- 9.7.17 It is anticipated that implementation of the plan is likely to reduce impacts on the local road network such that noise impacts are no more than minor and therefore not significant.

Construction Vibration

- 9.7.18 Vibration during the construction phases is primarily associated with piling activity. With respect to vibration, the recommended piling method is continuous flight augering. This method reduces adverse impacts as it does not involve driving piles into the ground using impulsive forces.
- 9.7.19 The closest existing vibration sensitive receptors are likely to be a minimum of approximately 10 m away from the closest demolition and construction works occurring on the Hollingworth Road land parcel boundary. BS 5228-2:2009+A1:2014 provides indicative levels of vibration associated with auger piling, which indicates a level of 0.2 mm/s peak particle velocity (PPV) at distance of 9 m.
- 9.7.20 Based on this indicative level, vibration levels as a result of auger piling are therefore likely to be below the proposed LOAEL and have a negligible effect.
- 9.7.21 The effects in EIA terms are therefore considered to be negligible and not significant.

Operational Phase

Proposed Residential Use

- 9.7.22 The acoustic model has been used to undertake an assessment to determine the suitability of the Hollingworth Road land parcel for primarily residential development, with regard to internal sound levels within dwellings and sound levels within external amenity areas based on guidance from ProPG.
- 9.7.23 A Stage 1 assessment in accordance with ProPG has been undertaken to assess the suitability of the Hollingworth Road land parcel for residential development with reference to nearby transportation noise sources.
- 9.7.24 Noise contours have been produced for the daytime and night-time for future year with development scenarios. (See **Figures 1.3 and 1.4 in Appendix G**).
- 9.7.25 Based on the acoustic model, the majority of the Hollingworth Road land parcel falls into the 'low noise risk' category. When sites are deemed to be in the 'low noise risk' category, ProPG advises that:

"The site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development."

- 9.7.26 Based on criteria defined within Approved Document O (ADO), parts of the development directly overlooking a noise source (i.e. the railway line and Hollingworth Road) are likely to be exposed to noise levels above the relevant criteria. Therefore, openable windows may not be a suitable method to prevent overheating.
- 9.7.27 The impact of noise levels on residential use is considered to be minor in noise terms, which is a minor effect in EIA terms and not significant. A good acoustic design process should be demonstrated within a noise impact assessment and can be secured through a suitably worded planning condition.

Proposed School

- 9.7.28 The proposed school will be located in the southeastern part of the Hollingworth Road Land Parcel. The internal ambient noise requirements vary depending on both the nature of the

school, and the proposed design. At this stage an indicative assessment has been undertaken to ascertain whether the principle of the school at the proposed location is acceptable.

- 9.7.29 **Figure 11.3, in Appendix G.3**, presents the daytime predicted $L_{Aeq,16hr}$ with development noise contours for the Hollingworth Road land parcel.
- 9.7.30 External ambient noise levels for the majority of the parcel of land designated for a proposed school are likely to be below the proposed LOAEL. As the majority of the proposed educational site impact is below the LOAEL, the impact is deemed to be negligible and not significant.
- 9.7.31 A good acoustic design process should be implemented at the detailed design stage for the primary school and a detailed noise impact assessment should be provided to demonstrate that the educational facility complies with the necessary guidance and regulations and that the noise impact is not significant.

Change in Ambient Noise Levels - Existing Receptors

- 9.7.32 The road traffic noise assessment considers the change in ambient noise levels upon the local road network links as a result of changes in the 18-hour AAWT traffic flows with and without the Development.
- 9.7.33 **Table 9.21** below presents the predicted change in noise levels, between the 'Future year with Development against the future year without development' scenarios, based on the future year with development traffic flows provided by the transport consultants.

Table 9.21 Road Traffic Impacts

Road Link	Junction of Traffic Counts	Calculated Change in Noise Level (dB $L_{A10,18hr}$)	Impact in Noise Terms
B6225 Hollingworth Road (N)	SA1	< 1	Negligible
Wardle Road	1	< 1	Negligible
A58 Halifax Road (E)		< 1	Negligible
A58 Halifax Road (W)		< 1	Negligible
Birch Road		< 1	Negligible
A58 Halifax Road (E)	2	< 1	Negligible
Old Road		< 1	Negligible
A58 Halifax Road (W)		< 1	Negligible
A58 Halifax Road (E)		< 1	Negligible
Smithy Bridge Road	3	< 1	Negligible
A58 Halifax Road (W)		< 1	Negligible
B6225 Smithy Bridge Road (E)	4	< 1	Negligible
B6225 Milnrow Road		< 1	Negligible
Smithy Bridge Road (W)		< 1	Negligible
B6225 Lake Bank	5	< 1	Negligible
The Beach Car Park		< 1	Negligible
Smithy Bridge Road (E)		< 1	Negligible
Milbury Drive		< 1	Negligible
B6225 Smithy Bridge Road (W)		< 1	Negligible

Road Link	Junction of Traffic Counts	Calculated Change in Noise Level (dB L _{A10,18hr})	Impact in Noise Terms
B6225 Hollingworth Road	6	< 1	Negligible
The Wine Press Car Park		< 1	Negligible
Rakewood Road		< 1	Negligible
B6225 Lake Bank		< 1	Negligible
A6033 Todmorden Road	7	< 1	Negligible
A58 Halifax Road (E)		< 1	Negligible
A58 Halifax Road (W)		< 1	Negligible
A58 Halifax Road (E)	8	< 1	Negligible
Canal Street		< 1	Negligible
A58 Halifax Road (W)		< 1	Negligible
A640 Rochdale Road	9	< 1	Negligible
B6225 Bridge Street		< 1	Negligible
A640 Elizabethan Way		< 1	Negligible
Wesley Street		< 1	Negligible
B6225 Kiln Lane	10	< 1	Negligible
Dale Street		< 1	Negligible
B6225 Bridge Street		< 1	Negligible
B6225 Wildhouse Lane		< 1	Negligible
Kiln Lane (E)	11	< 1	Negligible
B6225 Kiln Lane (W)		< 1	Negligible

9.7.34 The impact along the link roads identified in **Table 9.21** show the impact is likely to be negligible, which is not significant.

9.8 Vibration

9.8.1 Based on the levels obtained during the vibration survey and in reference to BS 6472-1 (BSI, 2008) it is deemed that vibration from trains passing on the railway line is unlikely to result in adverse effects at the Proposed Development site. This is a negligible impact and therefore not significant.

9.9 Secondary Mitigation and Enhancement

Operational Phase

Residential Use – External Noise Levels

9.9.1 The daytime noise levels in private external residential amenity areas are likely to be less than 50 dB L_{Aeq,16h}. Additional mitigation is not considered to be required but external levels should be assessed and ensured with a suitably worded planning condition.

Residential Use – Internal Noise Levels

9.9.2 A noise strategy that seeks to deliver the optimum acoustic outcome for the Hollingworth Road land parcel, without design compromises that will adversely affect living conditions and the quality of life of the inhabitants, will be put in place and ensured with a suitably worded planning condition.

- 9.9.3 Appropriate acoustic specification of building facade elements will result in appropriate internal conditions being achieved in residential dwellings across the Hollingworth Road Land Parcel.
- 9.9.4 Based on a review of external noise levels it is expected that appropriate internal noise levels can be achieved with the use of standard double glazing and trickle ventilation for the majority of the Hollingworth Road Land Parcel.

Proposed School

- 9.9.5 A preliminary review of the location of the proposed school shows that it is suitable with regards to the external ambient noise levels.
- 9.9.6 Meeting internal noise levels forms part of the Building Regulations and therefore achieving these is not a planning matter. At the detailed design stage, internal noise levels at the school will need to comply with the Building Regulations (Approved Document E, Requirement E4).

9.10 Residual Effects

Construction Phase

- 9.10.1 The residual effects of the construction noise are likely to be minor temporary, short term. The residual effects of construction vibration are likely to be negligible. However, further assessment of construction noise and vibration mitigation may be required as appropriate when detailed method statements and construction programme and phasing are available. Construction traffic impacts should be controlled through the CEMP and ensured through a suitably worded planning condition.

Operational Phase

- 9.10.2 By incorporating appropriate mitigation measures, operational external noise affecting proposed noise sensitive residential properties can be reduced so as to have negligible impact. The residual effects in EIA terms are likely to be negligible, which would be not significant.
- 9.10.3 With appropriate mitigation, the overall impact on internal noise levels in the proposed dwellings is negligible and not significant.
- 9.10.4 The change in noise levels at noise sensitive receptors as a result of traffic generated by the proposed development is likely to be negligible and not significant.
- 9.10.5 It is likely that the effects on the proposed school would be negligible and therefore not significant.

9.11 Cumulative Effects

- 9.11.1 Please refer to Volume 1: Chapter 10 for the cumulative effects of the Proposed Development including the Hollingworth Road land parcel and Rakewood Road land parcel.

9.12 Monitoring

- 9.12.1 No significant residual effects have been identified and, therefore, monitoring is not considered to be required.

9.13 Consideration of Climate Change

- 9.13.1 Potential climate change impacts are unlikely to significantly affect either baseline sound levels or predicted sound levels either generated by or incident on the Proposed Development.
- 9.13.2 However, overall increases in ambient temperature may increase the need for, or regularity of, opening windows for ventilation and cooling of residential property. This will be addressed as part of the development's compliance with applicable Building Regulations.

9.14 Conclusions

- 9.14.1 A noise and vibration assessment has been undertaken to determine the likely significant effects from, and upon, the Proposed Development. **Table 9.25** contains a summary of the results of the assessment.
- 9.14.2 Unattended and an attended environmental sound survey were undertaken between 11 and 12 September 2023 in order to determine the existing sound climate across the Hollingworth Road land parcel. The survey was conducted at several locations around the land parcel which are representative of proposed residential parcels of land and of existing dwellings surrounding the proposed development.
- 9.14.3 A vibration survey had been undertaken for approximately one hour to understand the potential impacts of vibration from passing trains upon the proposed development.
- 9.14.4 An acoustic model based on traffic data provided by the transport consultants, Curtins, was created to inform the baseline studies and to predict the likely road traffic noise impact arising from the operation of the Proposed Development, and the change of road traffic.
- 9.14.5 A quantitative assessment has been undertaken to assess construction noise impacts upon the Hollingworth Road land parcel, whilst a qualitative assessment has been undertaken to assess the likely vibration impacts associated with the construction phase of the proposed development. Preliminary calculations have been undertaken at the identified receptors in accordance with British Standard 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open sites and Guidelines on Noise Control for Construction Sites.
- 9.14.6 It is considered that, with mitigation in place as detailed above, the residual effects are likely to range between negligible and minor adverse, which is not significant. However, further assessment of construction noise and vibration mitigation may be required as appropriate when detailed method statements and the construction programme are available.
- 9.14.7 The potential noise impact on the residential areas of the proposed development has been assessed. **Figure 1.3 in Appendix G** shows all amenity areas are likely to experience levels of below 55 dB $L_{Aeq, 16 \text{ hour}}$ during the daytime. This impact is considered to be a minor and not significant.
- 9.14.8 Based on the calculated external noise levels it is expected that appropriate internal noise levels can be achieved with the use of acoustic double glazing and acoustic trickle ventilation at properties directly adjacent to the roads and railway lines. Away from roads and across the majority of the Hollingworth Road land parcel, it is expected that appropriate internal noise levels shown in **Table A14.6 in Appendix G** can be achieved with the use of standard double glazing and trickle ventilation. With appropriate mitigation, the overall impact on internal noise levels in the proposed dwellings is negligible and not significant.

- 9.14.9 Based on criteria defined within Approved Document O, it is likely that the parts of the development directly overlooking a noise source (i.e. the railway line and Hollingworth Road), are likely to be exposed to noise levels above the relevant criteria. Therefore, openable windows are unlikely to be a suitable method to prevent overheating. This will be addressed as part of the development's compliance with applicable Building Regulations. The change in noise levels as a result of traffic generated by the proposed development has been assessed. The results of the assessment show that the changes in noise levels due to the changes in road traffic are likely to be negligible at all noise sensitive receptors, which is not significant.
- 9.14.10 With appropriate design, it is likely that the effects on the proposed primary school would be negligible and not significant.

9.15 References

- Control of Pollution Act 1974, c.40
- Environmental Protection Act 1990 (as amended), c.43
- Department for Levelling Up, Housing and Communities (DLUHC) (2023) National Planning Policy Framework
- Department for Levelling Up, Housing and Communities (DLUHC) (2019) Planning Practice Guidance: Noise
- Department for Environment and Food and Rural Affairs (Defra) (2010) Noise Policy Statement for England
- Institute of Acoustics (IOA), Chartered Institute of Environmental Health (CIEH) and Association of Noise Consultants (ANC) (2017) Professional Practice Guidance on Planning and Noise
- Department for Transport Welsh Office (1988) The Calculation of Road Traffic Noise (CRTN)
- World Health Organization (WHO) (2018) Environmental Noise Guidelines for the European Region
- World Health Organization (WHO) (1999) Guidelines for Community Noise
- World Health Organization (WHO) (2009) Night Noise Guidelines for Europe
- Institute of Acoustics (IOA), Chartered Institute of Environmental Health (CIEH) and Association of Noise Consultants (ANC) (2017) Professional Practice Guidance on Planning and Noise
- Standards for Highways (2020) Design Manual for Roads and Bridges, LA 111, Noise and Vibration Revision 2
- The British Standards Institution (BSI) (2019) British Standard 4142:2014 +A1:2019 Methods for Rating and Assessing Industrial and Commercial Sound
- The British Standards Institution (BSI) (2014a). 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise

- The British Standards Institution (BSI) (2014b). 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration
- The British Standards Institution (BSI) (2014) British Standard 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

10 Socio-Economics

10.1 Introduction

- 10.1.1 This chapter assesses the likely socio-economic effects associated with the Proposed Development, and it sets out the relevant policies, approach and methodology used within this socio-economic assessment and presents the results of the assessment. The chapter has been prepared by Stantec's Development Economics Team. The authors are members of the Institute for Economic Development and specialise in developing socio-economic baselines and impact assessments with a particular focus on economic development and regeneration projects throughout the UK.
- 10.1.2 In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in **Appendix D**.

10.2 Policy Context, Legislation, Guidance and Standards

- 10.2.1 While there is no legislation relating to the assessment of socio-economic impacts, the summary below provides an overview of the policies of specific relevance to this socio-economic assessment.

National Planning Policy Framework

National Planning Policy Framework

- 10.2.2 National planning policy is contained principally in the National Planning Policy Framework (NPPF, December 2023). At the centre of the NPPF is the principle of sustainable development, with three overarching objectives: economic, social and environmental.
- 10.2.3 The social objective supports strong, vibrant and healthy communities by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being (paragraph 8a).
- 10.2.4 The economic objective is to help build a strong, responsive, and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure (paragraph 8b).
- 10.2.5 Significant adverse impacts on these 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 compensatory measures should be considered (paragraph 32).
- 10.2.6 So that sustainable development is pursued in a positive way, the NPPF states that 'plans should promote a sustainable pattern of development that seeks to: meet the development needs of their area; align growth and infrastructure; improve the environment; mitigate climate change (including by making effective use of land in urban areas) and adapt to its effects' (paragraph 11a).
- 10.2.7 Planning policies and decisions should aim to achieve healthy, inclusive and safe places that promote social interaction; are safe and accessible; and enable and support healthy lifestyles, especially where this would address identified local health and well-being needs

– for example, through the provision of safe and accessible green infrastructure, sports facilities, local shops, access to healthier food, allotments and layouts that encourage walking and cycling (paragraph 96).

- 10.2.8 To provide the social, recreational and cultural facilities and services the community needs, planning policies and decisions should ensure an integrated approach to considering the location of housing, economic uses and community facilities and services (paragraph 97).
- 10.2.9 In respect of education, the NPPF states that it is important that a sufficient choice of school places is available to meet the needs of existing and new communities, with local authorities taking a proactive, positive and collaborative approach to meeting this requirement through: giving greater weight to the need to create, expand or alter schools through the preparation of plans and decisions on applications; and working with school promoters, delivery partners and statutory bodies to identify and resolve key planning issues before applications are submitted (paragraph 99).
- 10.2.10 The NPPF is supported by Planning Practice Guidance (PPG)ⁱ on a range of different topics. Guidance is provided in respect of Environmental Impact Assessments, but socio-economic considerations are not specifically addressed.

Planning Practice Guidance (PPG)

- 10.2.11 The PPG supports the NPPF and covers a wide range of categories. Guidance is provided in respect of EIA, but socio-economic considerations are not specifically addressed. However, PPG categories which are of relevance to socio-economics and to this Proposed Development are:

- Effective use of land (HM Government, 2019).
- Housing needs of different groups (HM Government, 2021).
- Housing supply and delivery (HM Government, 2019).
- Open space, sports and recreation facilities, public rights of way and local green space (HM Government, 2014).

Local Planning policy

Rochdale Core Strategy

- 10.2.12 The Rochdale Core Strategy was adopted in October 2016 and sets out the long-term spatial strategy for the future development of Rochdale Borough. Core Strategy Policy C1 ('Delivering the right amount of homes in the right places'), and specifically the requirement 'to deliver at least 460 net additional dwellings per year up to 2028', is superseded by PFE Policy JP-H1 ('Scale, Distribution and Phasing of New Housing Development') which states that a minimum of 175,185 net additional dwellings will be delivered over the period 2022-2039, of which 10,472 dwellings will be delivered in Rochdale.
- 10.2.13 The Core Strategy acknowledges the oversupply of older homes and a need for improvements to attract and retain residents.
- 10.2.14 Relevant policies contained within the Core Strategy are:
- SO2 C3 – Delivering the right type of housing.
 - SO2 C6 – Improving health and wellbeing.

- S02 C7 – Delivering education facilities.
- S02 C8 – Improving community, sport, leisure and cultural facilities.
- S03 P2 – Protecting and enhancing character, landscape and heritage.
- S03 P3 – Improving design of new development.

10.2.15 The Core Strategy explains that there is a need to develop housing alongside other services in Littleborough. The Strategy seeks to improve transport within the borough, with a specific aim to locate new housing near public transportation (see Policy S02 – C3).

Places for Everyone

10.2.16 The Places for Everyone ('PfE') Plan - a long-term plan of nine Greater Manchester districts for jobs, new homes and sustainable growth – took effect and became part of the statutory development plan for each of the nine PfE authorities on 21 March 2024. The primary purpose of the PfE plan is to allocate strategic housing and employment sites. Bloor's land at Hollingworth Road is identified as residential allocation 'Policy JP Allocation 20: Land North of Smithy Bridge' within the adopted PfE Plan.

10.2.17 The policy allocation reads as follows:

'Development at this site will be required to:

- 1. Deliver around 300 new homes, including provision of larger (4, 5 and 6 bedroom) houses, or similar types of larger homes as agreed with the Local Planning Authority, and affordable housing in accordance with relevant local plan requirements;*
- 2. Achieve excellent design and sustainability through masterplanning and the use of design codes for the whole site to ensure comprehensive development;*
- 3. Deliver a landscape-led development, incorporating high-quality green and blue infrastructure, that takes advantage of the site's attractive setting next to Hollingworth Lake and the Rochdale Canal and reflects and responds to the special qualities and sensitivities of the key characteristics of the Pennine Foothills (West /South Pennines) landscape character type in accordance with policy JP-G1;*
- 4. Define the archaeological potential of the development site through the completion of archaeological evaluation in the form of geophysics, field walking and trial trenching for areas specified in the Land North of Smithy Bridge Historic Environment Assessment 2020. The masterplan must detail where significant archaeology must be preserved in situ and demonstrate how the development has responded sympathetically to this;*
- 5. Make provision for new and improved sustainable transport and highways infrastructure having regard to the indicative transport interventions set out in Appendix D in accordance with policy JP-C8. This should include facilitating high quality, safe and convenient walking and cycling routes through the site to provide improved linkages to key local destinations including Littleborough Town Centre, Hollingworth Lake, Rochdale Canal and the two railway stations – Smithy Bridge and Littleborough;*
- 6. Make provision for compensatory improvements to the environmental quality and accessibility of remaining Green Belt in the vicinity of the site in accordance with policy JP-G2;*
- 7. Carry out a project specific Habitats Regulation Assessment in relation to the Rochdale Canal for planning applications of 50 dwellings or more;*

8. Mitigate the recreation disturbance impacts on the South Pennine Moors SAC/SPAs with reference to JP-G5, criterion 7 (c);

9. Facilitate the delivery of a new primary school and associated outdoor playing space. Make financial contributions for offsite additional secondary school provision to meet needs generated by the development in accordance with policy JP-P5;

10. Development will be required to retain and enhance the existing visitor car parking spaces on the site, or provide replacement visitor car parking spaces in a suitable location nearby for any existing spaces lost; and

11. Consider the extraction of any viable mineral resources within Mineral Safeguarding Areas, in accordance with Policy 8 of the Greater Manchester Joint Minerals Development Plan (or any relevant policies in subsequent minerals plans).'

Greater Manchester Strategic Housing Market Assessment

10.2.18 The Greater Manchester Strategic Housing Market Assessment (SHMA) was updated in April 2021. Originally produced in 2019, the SHMA has been updated to reflect the changing environment for residential housing within the Greater Manchester area. It provides insight based on the local authorities within Greater Manchester (including Rochdale) and gives information into the profiles and housing needs of the authorities. For this project it can help align the outcomes with the results found in the assessment.

10.2.19 The Market Assessment structures its report to demonstrate how it meets different objectives with each chapter. The chapters that contain relevant policies to this report are as follows:

- Chapter 2 Defining the Housing Market Area- Identifying appropriate areas of assessment.
- Chapter 3 Local Housing Need- Clear understanding of number of new homes for each area.
- Chapter 4 Characteristics of Housing Market Area- Demographic and Socio-economic information.
- Chapter 6 Housing Needs of Particular Groups- Differing housing needs for the groups across Greater Manchester.
- Chapter 7 Affordable Housing Need Assessment- How much allocation should be given to affordable homes.

10.2.20 The SHMA identifies a goal of 11,392 new homes for Greater Manchester. The proposed development contributes towards objectives within both Rochdale and the wider region.

10.3 Consultation

10.3.1 This socio-economic assessment chapter has been developed via a desk-based assessment of the Proposed Development and the socio-economic conditions within the study area. The scope of this chapter has been subject to engagement and feedback from Rochdale Borough Council who provided a detailed opinion on the scoping report. The scope of this chapter has been expanded as a result of the feedback provided to include an assessment of the proposed development's impact on demand for nursery provision and dentists.

10.3.2 No consultation has taken place with public sector organisations or delivery agencies during the development of this draft chapter.

10.4 Methodology

- 10.4.1 This assessment broadly follows the EIA Methodology set out in Volume 1: **Chapter 6 (Assessment Method)** of this ES. This section sets out the discipline specific guidance relating to assessment approach, study areas, effect significance criteria and assumption and limitations.
- 10.4.2 The assessment comprises the following stages:
- Identification of current and future baseline conditions with respect to the above topics using information and statistics available in the public domain.
 - Assessment of likely significant effects of the Proposed Development on the environment by reviewing the baseline conditions and determining the change attributable to the Development using published formulae and guidance to assess effects.
 - Recommendation of mitigation or enhancement measures, if necessary.
 - Assessment of residual effects assuming implementation of the mitigation/enhancement measures;
 - Assessment of the cumulative schemes described within Volume 1: **Chapter 6 Assessment Method** for the potential to have likely significant cumulative effects on the environment when combined with the Proposed Development.

Scope of Assessment

- 10.4.3 The scope of this assessment is summarised in **Table 10.1** below. The scope of this chapter is focused on the employment impacts of the construction phase and beyond the construction phase, the assessment of the Proposed Development on the delivery of new homes, education, health and open space. Employment impacts, both during construction and operation are considered for the primary school on-site¹¹. Construction phase effects on housing, education, and open space have not been considered, as it is expected that the construction workforce and their families would not move to the area and therefore not create any additional demand. As such, it is considered that there is no potential for significant adverse effects relating to the construction phase. Beneficial impacts will relate to employment generation during construction.

Table 10.1 Summary of chapter scope

Topic	Impact
CONSTRUCTION	
Jobs	Employment generation (direct and indirect);
OPERATIONAL	
Homes	Delivery of new housing.
Education	Demand from the new residential population for education both for pre-school, primary and secondary schools.
Healthcare	Demand for GP and dental provision.
Open space	Impact of the proposed development on public open space.

¹¹ Assumed as a worst-case scenario to be 2 form entry (420 places) and 26 nursery places.

Study Area

- 15.1. Areas of interest identified for the purposes of assessing the effects of the proposed development on relevant receptors are set out below:
- **Population:** the area covered to consider matters such as demographics and deprivation will include Lower Super Output Areas (LSOAs), which make up the Littleborough Lakeside ward.
 - **Housing:** Greater Manchester North Eastern Housing Market Area¹², comprising the boroughs of Tameside, Oldham and Rochdale, whilst taking cognisance of the wider Greater Manchester strategic housing market area.
 - **Labour:** the area covered by the Greater Manchester Combined Authority area comprising the boroughs/districts of Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside and Trafford will be used to define the labour market study area. This area has been chosen as it takes into account the interaction of the Hollingworth Road land parcel with the wider Greater Manchester transport network, housing market areas, and commercial property market to best represents the mobility of labour across administrative boundaries. It is proposed to examine economic activity rates at the lowest spatial geography possible within the context of the Littleborough Lakeside ward, and how this area interacts within the wider Greater Manchester economy.
 - **Education:** defined as local primary schools within 3.2km (2 miles) and local secondary schools within 4.8km (3 miles) of the Hollingworth Road land parcel, taking account of catchment areas which will be impacted by the operational phase of the proposed development, including the Pennines North Primary planning area. This takes into account home to school travel guidance from UK Government¹³.
 - **Healthcare:** defined in line with the former NHS Heywood, Middleton and Rochdale Clinical Commissioning Group ('CCG') area¹⁴. The health care study area will take into account LSOA health indices for the relevant local ward area.

Baseline Data Collection

- 10.4.4 To inform the assessment, a desk-based review of publicly available data has been undertaken to establish relevant baseline socio-economic conditions in the vicinity of the proposed development and across the identified study areas, as well as to consider how these conditions compare with the regional and national average. The following socio-economic indicators were considered:
- Current demographic characteristics, including population size and age structure.
 - Future population projections.
 - Current housing market characteristics including housing stock profile and housing targets (including affordable housing), as informed through relevant planning policy documentation.

¹² As established in the Greater Manchester Strategic Housing Market Assessment 2008

¹³ Department for Education (2014) Home to School Travel and Transport Guidance

¹⁴ The CCG ceased to exist at the end of June 2022 and its functions were taken over by NHS Greater Manchester Integrated Care.

- Current and future education provision and capacity for primary schools and secondary schools within the corresponding study areas.
- Current primary healthcare facilities, specifically the capacities of GPs informed by publicly available information of registered patient rolls, number of GPs, and existing capacity or demand pressure.
- Current labour market characteristics, including working age population profile (level of economic activity, occupation and skills profiles) as well as the workplace economy profile (employment by industry and earnings).

Topic specific methodologies

Housing

- 10.4.5 Household size is calculated by dividing the number of households by the number of bedrooms. Census 2021 Table RM136¹⁵ details the tenure by household size by number of bedrooms.
- 10.4.6 Existing baseline housing conditions, in respect of the type and tenure of homes, have been informed by the ONS, 2021 Census and the Greater Manchester Strategic Housing Market Assessment (SHMA) (2019).
- 10.4.7 The impact of the Proposed Development on the local housing stock is a qualitative assessment based on the contribution that the proposed development will make to the identified housing requirements for as set out in the adopted Rochdale Core Strategy (2016) that guides development up to 2028.

Education (Early Years, Primary and Secondary Phase)

- 10.4.8 Baseline conditions, in respect of the existing numbers of pupils in nursery settings, has been collected from Ofsted inspection reports. Data on each individual primary and secondary school roll, along with current school capacities, have been informed by information held on the following website - <https://www.get-information-schools.service.gov.uk>.
- 10.4.9 For primary and secondary education, the assessment is quantitatively based on the number of primary/secondary pupils generated by the Proposed Development versus the level of surplus or deficit forecast primary/secondary school places, plus primary mitigation.
- 10.4.10 For the purposes of this assessment, secondary education is defined as school years 7 to 11 (children aged 11 to 15 years).

Open Space

- 10.4.11 For analysis of current public open space provision (children's play areas, teenage provision, amenity space, playing pitches, outdoor sport, natural and semi natural open space, allotments) this has been defined as the Hollingworth Road land parcel and surrounding area within 1km including access to the Proposed Development.
- 10.4.12 Impact assessment of new provision within the Proposed Development is considered at site level. It is not possible at this stage in the design process to assess provision against Local Plan policy for walking catchments as the exact location of the public open space has not been determined.

¹⁵ Available online at: <https://www.ons.gov.uk/datasets/RM136/editions/2021/versions/1#get-data>

Healthcare (GP and dentist provision)

- 10.4.13 Baseline conditions for GP provision are assessed through reference to the NHS GP Workforce Statistics, which provide total patient list size for individual GP practices and the number of full time equivalent (FTE) GPs at each practice. To determine whether existing GP provision is under or over-capacity, GP to patient ratios of selected practices have been compared to the Healthy Urban Development Unit (HUDU) standard of 1 GP for every 1,800 people. This, however, is an approximate guide only as workload is also affected by population characteristics such as health and age.
- 10.4.14 The assessment of likely significant effects has been quantitatively based on the number of future residents anticipated to live in the Proposed Development versus the number of surplus or deficit patient places within the selected GP provision. To assess the worst-case, it has been assumed that all residents of the proposed development will be new to the area and will draw from local NHS GP resources.
- 10.4.15 Baseline conditions for dentist provision have been assessed through reference to the workforce dataset within the NHS Dental Statistics for England which details the number of practices and dentists in England. The demand for dentist places is based on the number of NHS dentists per 1,000 population in England compared to the additional number of residents generated by the proposed development. NHS Dental Statistics for England show there were 24,272 dentists performing NHS activity in England during 2021-22 providing an average of 2,329 people per NHS dentist or 0.43 dentists per 1,000 population¹⁶.
- 10.4.16 Further consideration of the effects of the Proposed Development on health and wellbeing are considered within the stand-alone Health Impact Assessment submitted with the application.

Labour Market and Business

- 10.4.17 Baseline employment conditions in relation to residential economic activity and occupations have been informed by the ONS, Annual Population Survey (APS), for the 12 months to December 2023.
- 10.4.18 Baseline employment conditions in relation to the number of jobs (workplace-based) by industrial sector, have been sourced from the ONS, Business Register and Employment Survey (BRES) 2022. The BRES provides a count of employees, excluding self-employment jobs and government-supported trainees and HM Forces.
- 10.4.19 Baseline conditions regarding resident wages have been sourced from the Annual Survey of Hours and Earnings, Office for National Statistics. The dataset provides wage mean and median wage levels at a Local Authority, regional and national level. The data presented refers to 2022, the latest available data.
- 10.4.20 Assessment is quantitatively made based on the number of jobs created. The number of direct jobs generated during the construction phase has been assessed using the estimated construction cost of the Proposed Development and the turnover per worker of the construction sector in the North West.
- 10.4.21 Guidance from the HCA, Additionality Guide, 2014 (Additionality Guide) and more recently, HM Treasury Green Book, establishes that direct jobs generated by the proposed development would most likely be subject to a degree of 'displacement' (the level of employment likely to be lost, moved or adversely affected by the employment created as a result of the proposed development); 'leakage' (referring to the number of jobs likely to be

¹⁶ Population per Dentist based on NHS dentist numbers and the Mid-Year Population estimate for England. Source: Office for National Statistics, 2021.

taken up by people outside the Labour Market Study Area), and; 'multiplier effects' (the additional economic benefit that will be derived as a direct result of the income earned by the new employment as an indirect result of the supply chain linkages).

10.4.22 These factors are collectively known as 'additionality' factors. They enable quantification of the employment effect to the Labour Market Study Area, that is, the net increase in the number of employed residents in the Labour Market Study Area attributable to the proposed development and the jobs it is expected to generate. The additionality adjustments assumed in this assessment are presented in **Table 10.17**.

Effect significance criteria

10.4.23 For employment effects, the availability of labour and skills is critical in accommodating the demands, needs and requirements of the Proposed Development. The sensitivity of the labour market has been defined in relation to:

- The availability of skilled labour in the Labour Market Study Area, relative to regional and national averages.
- The proportion of employment in relevant sectors (e.g. construction, manufacturing, wholesale, and retail trade) within the Labour Market Study Area.
- The availability of labour (including the unemployed) within the Labour Market Study Area.
- Relevant education and training provision provided by institutions serving the Labour Market Study Area.
- Plentiful labour and / or skills capacity results in a low sensitivity, whilst limited labour and / or skills capacity results in a high sensitivity. Sensitivity criteria relating to employment are shown in **Table 10.2**.

Table 10.2 Labour market sensitivity

Sensitivity	Example
High	There is a shortfall of appropriate labour and skills. The proposed development would therefore lead to labour market pressure and distortions (i.e. skills and capacity shortages, import of labour, wage inflation).
Medium	There is a low or limited supply of appropriate labour and skills. The proposed development may therefore lead to labour market pressure or distortions.
Low	There is a readily available supply of appropriate labour and skills. The proposed development is therefore unlikely to lead to labour market pressure or distortions.

Source: Stantec (2022)

Sensitivity of Other Receptors

10.4.24 For wider socio-economic effects including changes to the housing market, education, healthcare, and community infrastructure, receptor sensitivity has been determined with reference to the importance of the receptors established in the baseline conditions and the extent to which any change upon these could affect their performance or livelihood. The sensitivity of relevant receptors has therefore been defined on a case-by-case basis and is explained within the assessment for each individual receptor.

Magnitude of Change

10.4.25 The magnitude of change from the construction and operation of the Proposed Development on identified socio-economic receptors is determined using the criteria set out

in the **Table 10.3** below. The assessment of predicted Magnitude of Change from the proposed development has been informed by publicly available information sources at the time of this assessment.

Table 10.3 Magnitude of Change Criteria

Magnitude	Type of Change	Criteria
High	Adverse	Employment changes: the number of jobs lost in the Study Area would be 250 or greater (based upon the EU definition of small and medium enterprises (European Commission, 2003). Other socio-economic changes: adverse changes to identified receptors would be observed on an international, national or regional scale. Changes are likely to be experienced over the long term (i.e. 5+ years).
	Beneficial	Employment changes: the number of jobs created in the Study Area would be 250 or greater. Other socio-economic changes: beneficial changes to identified receptors would be observed on an international, national or regional scale. Changes are likely to be experienced over the long term (i.e. 5+ years).
Medium	Adverse	Employment changes: the number of jobs lost in the Study Area would be 50 or greater, but fewer than 250. Other socio-economic changes: Noticeable adverse changes, judged to be important at a local scale, to identified receptors. Changes are likely to be experienced over the medium term (i.e. 2-5 years).
	Beneficial	Employment changes: the number of jobs created in the Study Area would be 50 or greater, but fewer than 250. Other socio-economic changes: Noticeable beneficial changes, judged to be important at a local scale, to identified receptors. Changes are likely to be experienced over the medium term (i.e. 2-5 years).
Low	Adverse	Employment changes: the number of jobs lost in the Study Area would be greater than 10, but fewer than 50. Other socio-economic changes: Small scale adverse changes to identified receptors at the local level only. Changes are likely to be experienced over the short term (i.e. less than 2 years).
	Beneficial	Employment changes: the number of jobs created in the Study Area would be greater than 10, but fewer than 50. Other socio-economic changes: Small scale beneficial changes to identified receptors at the local level only. Changes are likely to be experienced over the short term (i.e. less than 2 years).
Negligible	Adverse	Employment changes: the number of jobs lost in the Study Area would be less than 10. Other socio-economic changes: very small-scale adverse changes to identified receptors at the local level only. Changes are likely to be experienced over the short term (i.e. less than 2 years).
	Beneficial	Employment changes: the number of jobs gained in the Study Area would be less than 10. Other socio-economic changes: very small-scale beneficial changes to identified receptors at the local level only. Changes are likely to be experienced over the short term (i.e. less than 2 years).
	No Change	No change would be perceptible, either beneficial or adverse.

Significance Matrix of Socio-economic Effects

10.4.26 In line with standard EIA practice, a matrix-based approach is adopted to consider the sensitivity of identified receptors in tandem with the likely magnitude of change from the proposed development. This method allowed the level and significance in EIA terms of all predicted socio-economic effects to be determined. The EIA significance matrix adopted in this assessment is detailed in the table below.

Table 10.4 Significance matrix

Sensitivity	Magnitude of change			
	High	Medium	Low	Negligible
High	Major	Major – Moderate	Moderate – Minor	Negligible
Medium	Major – Moderate	Moderate – Minor	Minor	Negligible
Low	Moderate - Minor	Minor	Minor – Negligible	Negligible

10.4.27 The duration of temporary environmental effects is defined as follows:

- Short-term – Less than one year.
- Medium-term – One to five years.
- Long-term – Five years to ten years.

10.4.28 For the purposes of undertaking the assessment in accordance with the EIA Regulations, only effects determined to be moderate or greater are considered significant in EIA terms.

Limitations

10.4.29 The construction cost has been estimated using BCIS benchmarks for schemes in Rochdale, using quarter three, 2024 prices. The labour market construction impacts will vary depending on the contraction value of the scheme.

10.4.30 The assessment relies on secondary survey data published by the Government and its official statistics authority (the ONS). Each data source has methodological limitations related to data collection and the data only represents the socio-economic context at a specific point in time.

Baseline Evolution

Households

10.4.31 The 2021 Census reports that there are 90,223 households in Rochdale and 4,260 in Littleborough. Littleborough has an average household size of 2.17 persons per household, slightly smaller than the regional and national average persons per household at 2.31 and 2.37 persons per household respectively.

10.4.32 Accommodation within the study area is mainly characterised by terraced and semi-detached housing, with these making up over 70% of the housing in the area. Terraced housing is the dominant housing type, accounting for over 40% of housing, compared to 23% across England and 28% across the North West. Just over three in ten houses are semi-detached, in line with the North West average but slightly below the England average.

Table 10.5 Household Accommodation Types

Type	Littleborough lakeside ward	Greater Manchester North Eastern Housing Market Area	North West	England
Detached	752	39,415	599,838	5,368,859
Semi-detached	1,327	104,247	1,160,271	7,378,304
Terraced	1,785	100,817	886,330	5,381,432
Flats	264	32,572	394,015	3,999,771
Other ¹⁷	132	5,838	112,950	1,307,719
Total	4,260	282,889	3,153,404	23,436,085

Source: Household Accommodation Types NOMIS (TS044), Census 2021

10.4.33 **Table 10.6** below presents the tenure of properties within study areas, the North West and England. The data shows that most housing in the Lakeside Ward is owned, making up just over 70% of the properties in the area. This is approximately 10% higher than the national and regional averages. There are lower levels of social rented accommodation in the Lakeside Ward (8.0%) compared the regional and national (20.9%) and regional (17.6%) averages.

Table 10.6 Tenure (Housing Study Area)

Tenure	Littleborough Lakeside ward	Greater Manchester North Eastern Housing Market Area	North West	England
Owned	3,054	171,127	1,965,545	14,369,065
Shared Ownership	6	1,074	21,551	235,951
Social Rent	340	59,700	555,764	4,005,663
Private Rent	859	50,460	606,844	4,794,889
Living rent free	0	528	3,699	30,517
Total	4,259	282,889	3,153,403	23,436,085

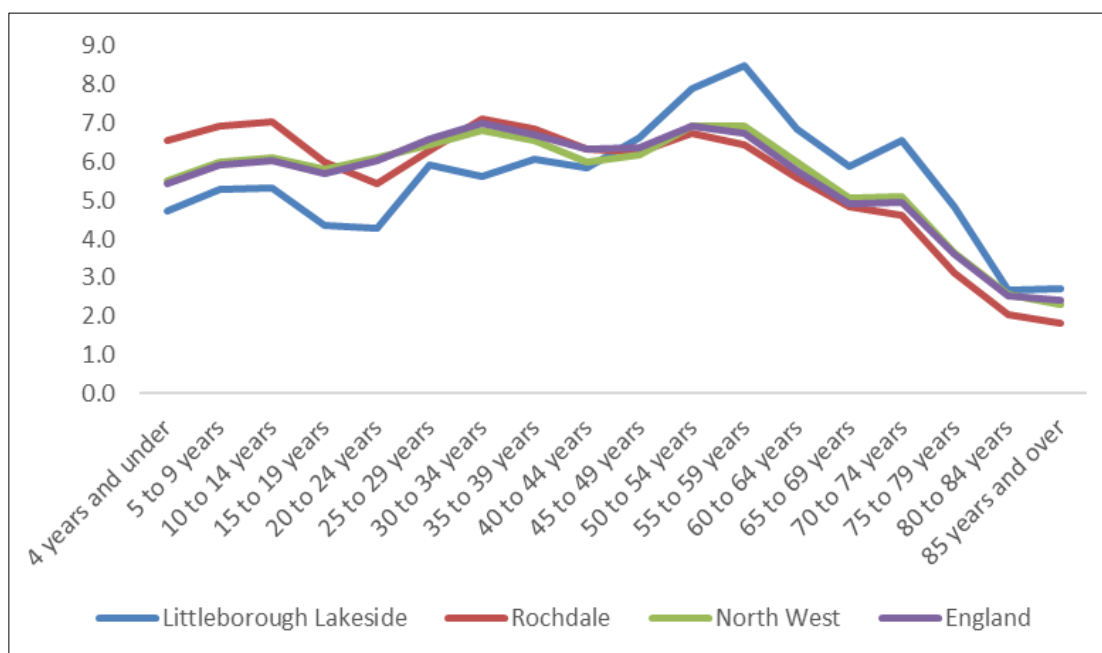
Source: Tenure (Housing Study Area), NOMIS (TS054), Census 2021

Population

10.4.34 Littleborough Lakeside ward had a population of 9,374 people, as of Census Day, March 2021. The age profile of Littleborough shows a general underrepresentation of people under the age of 44, and an overrepresentation of people aged between 45-79 years of age.

10.4.35 At the same point in time, Rochdale had a resident population of 223,775. The age profile was broadly consistent with that of the North West and England. However, Rochdale exceeded the regional and national averages for proportion of the population under the age of 15 years. Conversely, the proportion of Rochdale's population aged 65 and over was smaller than both the North West and England.

Figure 10.1: Proportion of Population by Age Band



Source: TS007 - Age by single year, Nomis, ONS Census 2021

10.4.36 Looking forward, the ONS population projections indicate that the Rochdale population will increase by 10.1% over the next 20 years; this is higher than the rate of growth forecast in the North West and England respectively. The increase in the over 65 population is disproportionate to the increase in the under 15 and working age population, which is consistent with the regional and national comparators.

10.4.37 The percentage increase in the young and working age population between 2023 and 2043 is greater in Rochdale, than in the North West (6.2%) and England (7.3%) respectively. The under 15 population is projected to grow by 0.7% in Rochdale between 2023 and 2043, whereas in the North West and England, this age demographic is projected to decline by 0.9% and 2.2% respectively. The increase in the working age population in Rochdale exceeds the regional and national average by 6.3 and 5.8 percentage points respectively.

Table 10.7 Population Projections¹⁸

Population Projections	Ages	2023	2033	2043	Percentage Change	Proportion of Population by 2043
Rochdale	Age 0-15	48,717	46,821	49,072	0.7%	19.6%
	Age 16-64	140,481	146,695	151,718	8.0%	60.5%
	Age 65+	38,771	46,173	50,094	29.2%	20.0%
	All ages	227,976	239,690	250,883	10.1%	100.0%
North West	Age 0-15	1,415,932	1,351,738	1,403,103	-0.9%	17.7%
	Age 16-64	4,585,874	4,612,890	4,665,959	1.7%	59.0%
	Age 65+	1,451,989	1,729,416	1,843,546	27.0%	23.3%
	All ages	7,453,802	7,694,050	7,912,590	6.2%	100.0%

¹⁸ Population projections are not available at ward level geographies.

Population Projections	Ages	2023	2033	2043	Percentage Change	Proportion of Population by 2043
England	Age 0-15	10,892,430	10,293,424	10,650,360	-2.2%	17.2%
	Age 16-64	35,623,633	36,090,124	36,366,778	2.1%	58.9%
	Age 65+	11,041,544	13,408,398	14,726,978	33.4%	23.9%
	All ages	57,557,526	59,792,008	61,744,108	7.3%	100.0%

Source: Population projections - local authority based by single year of age, NOMIS. Note* The sum of the age breakdown does not match the all ages figure due to rounding

Education

10.4.38 All three and four-year-olds in England are eligible for up to 570 free hours of childcare per year. This is usually taken as 15 hours a week for 38 weeks a year. Parents and guardians are offered flexibility in how the free childcare entitlement is used and can choose, for example, to take fewer hours over more weeks¹⁹. Free childcare is also available for some two years olds depending on the economic criteria of a child's parents or guardians. The need for early years education can be met in various ways including:

- School run maintained nursery classes.
- Pre-schools that may be run by schools, or the private or voluntary sector.
- Day nurseries offering childcare and early year education for children from 0 to 5 years old. This provision is market led and many day nurseries are run as small private operations.
- Child minders.
- Breakfast, after school and holiday clubs.

10.4.39 **Table 10.8** below summarises the available nursery provision within two miles of the Proposed Development.

Table 10.8 Nursery School Capacity

Nursery school	Location	Capacity	Children enrolled	Spare Capacity
1 st Safari – Genesis (Milnrow)	23 Clifton Street, Milnrow, Rochdale, OL16 4HP	72	37	35
The Apple Tree Private Day Nursery	11 Howarth Cross Street, Rochdale, OL16 2PB	72	65	7
First Steps Private Day Nursery	Newall Street, Littleborough, OL15 9DL	34	41	-7
Happy Jacks Children's Day Nursery	26 Centre Vale, Todmorden Road, Littleborough, OL15 9EL	52	51	1
Little Gems	Unique Enterprise Centre, Belfield Road, Rochdale, OL16 2UP	37	22	15
Little Sparks Wardle	415 Birch Road, Wardle, Rochdale, OL12 9LH	45	84	-39

¹⁹ Source: <https://www.gov.uk/help-with-childcare-costs/free-childcare-and-education-for-2-to-4-year-olds>

Nursery school	Location	Capacity	Children enrolled	Spare Capacity
Newbold Children's Centre Nursery	Moss Street, Rochdale, OL16 5NL	56	71	-15
The Old Library Private Day Nursery	Wardle Road, Rochdale, OL12 9ER	56	81	-25
The Railway House Nursery	1A Railway Street, Littleborough, OL15 8AG	30	60	-30
Seeros Daycare Nursery	Trafalgar Centre, Belfield Road, Rochdale, OL16 2UX	69	100	-31
Tinkerbelle Private Nursery	William Street, Littleborough, OL15 8JP	60	39	21
Total		583	651	-68

Source: OFSTED and <https://www.get-information-schools.service.gov.uk/Establishments>.

10.4.40 Nursery school provision in the Education Study Area is offered at 11 settings, as shown in the table above, that offer 583 nursery school places. Over half of the providers are currently over capacity resulting in total enrolment exceeding capacity by 68 places. Nursery provision is therefore considered to have a **high** sensitivity to change.

10.4.41 Primary school provision in the Education Study Area is offered at 17 schools as shown in **Table 10.9**. Overall, there is provision of 5,354 primary school places across the 17 schools identified.

Table 10.9 Primary School Capacity

Primary school	Location	Age	Capacity	Enrolled	Spare Capacity
Alice Ingham Roman Catholic Primary School	Millgate, Halifax Road, Rochdale, OL16 2NU	5 - 11	168	159	9
All Saints Church of England Primary School	Maud Street, Rochdale, Lancashire, OL12 0EL	3 - 11	210	228	-18
Belfield Community Primary School	Samson Street, Belfield, Rochdale, OL16 2XW	3 - 11	457	406	51
Crossgates Primary School	Kiln Lane, Milnrow, Rochdale, OL16 3HB	4 - 11	315	317	-2
Hamer Community Primary Schools	Albert Royds Street, Rochdale, OL16 2SU	3 - 11	345	321	24
Heybrook Primary School	Park Road, Rochdale, OL12 9BJ	2 - 11	694	704	-10
Holy Trinity CE Primary School	Victoria Street, Littleborough, OL15 9DB	4 - 11	220	215	5
Kentmere Primary Academy	Kentmere Avenue, Smallbridge, Rochdale, Lancashire, OL12 9EE	3 - 11	345	356	-11
Littleborough Community Primary School and Nursery	Calderbrook Road, Littleborough, OL15 9HW	3 - 11	465	363	102
Milnrow Parish Church of England Primary School	St James Street, Milnrow, Rochdale, OL16 3JT	4 - 11	210	207	3
Moorhouse Academy	Crossley Street, Milnrow, Rochdale, OL16 4DR	3 - 11	240	240	0
Smithy Bridge Primary School	Bridgenorth Drive, Littleborough, OL15 0ES	3 - 11	450	435	15
St Andrew's Church of England Primary School and Nursery	Union Road, Rochdale, Lancashire, OL12 9QA	3 - 11	360	451	-91

Primary school	Location	Age	Capacity	Enrolled	Spare Capacity
St James Church of England Primary School	Crossfield Road, Wardle, Rochdale, OL12 9JW	4 - 11	210	208	2
St Mary's Roman Catholic Primary School	Whitelees Road, Littleborough, OL15 8DU	3 - 11	210	219	-9
St Patrick's Roman Catholic Primary School	Foxholes Road, Rochdale, Lancashire, OL12 0ET	4 - 11	315	300	15
Stansfield Hall Primary School	Todmorden Road, Summit, Littleborough, OL15 9PR	5 - 11	140	120	20
Total			5,354	5,249	105

Source: <https://www.get-information-schools.service.gov.uk/Establishments>.

10.4.42 While some primary schools identified are shown to be over or nearing capacity, others show significant capacity with 20 or more places available at 4 out of 17 local primary schools. There is a net a spare capacity of 105 primary school places across the 17 institutions. The vast majority of this spare capacity is found within Littleborough Community Primary School and Nursery. As a result of the spare capacity locally, primary schools are considered to have a **low** sensitivity to change.

10.4.43 Secondary school provision in the Education Study Area is offered at four schools as shown in **Table 10.10** below.

Table 10.10 Secondary School Capacity

Secondary school	Location	Age	Capacity	Enrolled	Spare Capacity
Falinge Park High School	Falinge Road, Shawclough, Rochdale, OL12 6LD	11 - 16	1,338	1,352	-14
Hollingworth Academy	Cornfield Street, Milnrow, Rochdale, OL16 3DR	11 - 16	1,350	1,341	9
Kingsway Park High School	Turf Hill Road, Rochdale, OL16 4XA	11 - 16	1,330	1,341	-11
Wardle Academy	Birch Road, Wardle, Rochdale, OL12 9RD	11 - 16	1,200	1,296	-96
Total			5,218	5,330	-112

Source: <https://www.get-information-schools.service.gov.uk/Establishments>.

10.4.44 Overall, the secondary school pupil population within the Education Study Area is exceeding local secondary school availability by 112 places. This is primarily driven by the oversubscription of Wardle Academy by 96 places. Falinge Park and Kingsway Park High School are oversubscribed by 14 places and 11 places respectively. Hollingworth Academy is the only exception with 9 spare places. The level of oversubscription within secondary school provision means the receptor is considered to have a **high** sensitivity to change.

Healthcare

10.4.45 GP practices in the Heywood, Littleborough and Rochdale Integrated Care Board are listed in **Table 10.11**, with corresponding GP, nurse, and patient figures.

Table 10.11 Healthcare provision

Practice code	Practice name	GP FTE	Nurses FTE	Patients	Patient / GP Ratio	Patient / Nurse Ratio
P86006	Ashworth Street Surgery	10.19	4.27	16,701	1,639	3,914
Y02718	Birtle View Medical Practice	4.53	0.71	4,154	918	5,878
P86009	Castleton Health Centre	8.96	3.68	10,143	1,132	2,756
P86014	Croft Shifa Health Centre	3.20	0.99	8,138	2,543	8,248
P86614	Dr A Hamid	1.01	-	4,836	4,772	-
P86002	Dr Gwd Bhima	1.07	0.96	1,565	1,467	1,630
P86619	Dr Mb Ghafoor & Partners	1.55	0.80	6,622	4,281	8,278
P86019	Durnford Medical Centre	5.27	0.85	9,878	1,876	11,576
P86003	Edenfield Road Surgery	4.85	3.20	11,091	2,285	3,466
P86606	Family Practice	2.16	-	4,779	2,213	-
P86602	Heady Hill Surgery	4.69	0.93	3,382	721	3,624
P86013	Healey Surgery	8.05	1.57	6,246	776	3,970
P86016	Heywood Health	10.80	1.95	8,842	819	4,542
P86023	Hopwood Medical Centre	7.49	0.91	9,143	1,220	10,084
P86017	Inspire Medical Centre	1.33	-	4,717	3,538	-
Y02721	Kirkholt Medical Practice	2.21	0.57	4,595	2,076	8,015
P86018	Littleborough Group Practice	5.23	3.59	8,599	1,645	2,397
P86011	Longford Street Medical Centre	4.91	1.23	8,687	1,770	7,082
P86008	Mark Street Surgery	6.86	1.81	10,157	1,481	5,601
Y02795	Middleton Health Centre	1.63	2.00	4,829	2,969	2,415
P86001	Milnrow Village Practice	4.51	2.43	7,735	1,716	3,187
P86021	Pennine Surgery	1.47	1.21	3,602	2,456	2,969
P86004	Peterloo Medical Centre	10.60	1.36	8,813	831	6,480
P86015	Rochdale Road Medical Centre	2.16	0.64	5,431	2,514	8,486
P86022	Stonefield Street Surgery	7.65	2.32	8,731	1,141	3,763
P86609	The Dale Medical Practice	1.09	-	2,516	2,301	-
P86026	The Dawes Family Practice	3.59	-	7,624	2,122	-
Y00726	The Hive Health Centre	3.01	0.80	5,554	1,843	6,943
P86010	The Junction Surgery	5.33	1.21	8,575	1,608	7,067
Y02720	The Kingsway Practice	2.89	1.28	4,124	1,425	3,222
P86608	The Village Medical Ctr.	0.21	1.64	4,365	20,461	2,662
P86624	Trinity Medical Centre	4.03	2.03	4,242	1,053	2,093
P86007	Wellfield Health Centre	8.69	2.47	13,642	1,569	5,531
P86620	Windermere Surgery	1.92	-	2,843	1,481	-
P86012	Woodside Medical Centre	5.13	1.01	9,080	1,769	8,961
P86005	Yorkshire St Surgery	-	1.25	6,242	-	4,980
Total		158.29	49.67	250,223	1,581	5,038

Source: NHS Digital General Practice Data (NHS Greater Manchester ICB – 01D, April 2024)

10.4.46 A total of 15 GP practices have patient loads above the 1,800-patient per NHS GP benchmark identified within the Healthy Urban Development Unit (HUDU)'s model²⁰ suggesting these practices are operating at full capacity. However, demands on health practitioners time relates to the demographics of the people on the register as well as underlying health, and the other practices which may also be under strain. The data indicates that the sensitivity is **low**, due to the total area GP / patient ratio being 1,581; which is considerably lower than the NHS benchmark.

10.4.47 There are 30 dental practices operating within the Rochdale Local Authority boundary, which encompasses Rochdale, Littleborough, Heywood and Middleton²¹. The majority of practices have been inspected by the Care Quality Commission (CQC). In these reports, the inspectors state the number of Dental Practitioners and Dental Nurses working at a practice. Where a practice is yet to be inspected by the CQC, we have searched the practice's website to find the team overview.

10.4.48 There were three practices that have no reports and no website, and so no reliable figure could be drawn for the number of practitioners or nurses working at these practices²². These practices have accordingly been excluded from the assessment.

Table 10.12 Dentistry Provision

Name	Address	Dentists	Nurses
Deeplish Dental Practice	1st Floor, Nye Bevan House, Rochdale, Lancashire, OL11 1DN	5	4
Mike Brown Dental	163 Drake Street, Rochdale, Lancashire, OL11 1EF	2	3
Drake Dental Practice	113 Drake Street, Rochdale, Lancashire, OL16 1PZ	5	12
One Dental	1 Milnrow Road, Rochdale, Greater Manchester, OL16 1UG	4	6
Roch Valley Dental	23 Roch Valley Way, Rochdale, Greater Manchester, OL11 4PZ	7	20
Mr John Booth - 4A Dental	4a Balderstone Road, Rochdale, Greater Manchester, OL11 2AJ	3	4
Waterside Dental Care	330 Yorkshire Street, Rochdale, Lancashire, OL16 2DS	2	4
Kirkholt Dental Centre	6-7 The Strand, Rochdale, OL11 2JG	-	-
Croft Shifa Dental Practice	Croft Shifa Health Centre, Rochdale, Greater Manchester, OL16 2UY	-	-
K.L.M. Dental	Croft Shifa Health Centre, Belfield Road, Rochdale, Greater Manchester, OL16 2UP	-	-
518 Dental	518 Bury Road, Rochdale, Lancashire, OL11 4DQ	4	-
Better Dental Ltd	758 Manchester Road, Rochdale, Lancashire, OL11 3AW	2	3
Edenfield Dental Care	386 Edenfield Road, Rochdale, Lancashire, OL12 7NH	4	6
Dale Street Dental Practice	36 Dale Street, Rochdale, Greater Manchester, OL16 4HS	1	4
Milnrow Center OF Dental Excellence	107 Dale Street, Milnrow, Rochdale, Lancashire, OL16 3NW	2	2

²⁰ Source: Healthy Urban Development Unit, (2009). HUDU Model

²¹ Source: Care Quality Commission (2023). Available online at: <https://www.cqc.org.uk/search/all>

²² These practices were Kirkholt Dental Centre, Croft Shifa Dental Practice, and Dale Street Dental Practice.

Name	Address	Dentists	Nurses
Bamford Dental Practice	Norden Road, Rochdale, Greater Manchester, OL11 5PT	12	19
Dentistry@442	442 Birch Road, Rochdale, Lancashire, OL12 9LH	2	2
Heywood Dental Practice	6 Manchester Street, Heywood, Lancashire, OL10 1DL	2	4
Tailor & Gibb	66 Church Street, Heywood, Lancashire, OL10 1LJ	4	6
York Street Dental Care	27 York Street, Heywood, Lancashire, OL10 4NN	4	2
DHS Dental Practice - Phoenix Centre	The Phoenix Centre, Heywood, Lancashire, OL10 1LR	2	3
Phoenix Centre	Church Street, Heywood, Lancashire, OL10 1LR	1	2
Hopwood Dental Practice	181 Manchester Road, Hopwood, Lancashire, OL10 2PP	3	3
Fletcher Fosbrook Dental Surgery	42 Market Street, Heywood, Lancashire, OL10 4LY	2	4
Littleborough Dental Practice	115 Featherstall Road, Littleborough, Lancashire, OL15 8JZ	5	6
MF Dental Littleborough	60 -62 Church Street, Littleborough, Lancashire, OL15 8AU	4	7
Church Street Dental Care	69 Church Street, Littleborough, Lancashire, OL15 8AB	1	4
Whittingham, Casserley & Chandy Dental Surgeons	Dental Surgery, 117 Long Street, Manchester, Lancashire, M24 6DL	7	22
Langley Dental Practice	215a Wood Street, Manchester, Lancashire, M24 5RU	11	13
Middleton Bank Dental	1 Long Street, Manchester, M24 6TE	4	5
Alkrington Dental	64 Mount Road, Manchester, Lancashire, M24 1DZ	1	4
Total		106	174

Source: Care Quality Commission (2023)

10.4.49 Cumulatively, there are 106 Dental Practitioners and 174 Dental Nurses, for 27 of the 30 Dental Practices where data was available.

10.4.50 Based on the Rochdale population of 223,775 people. This equates to one dental practitioner per 2,111 people. This figure is considerably lower than the 2,329 people per Dental Practitioner average for England²³.

10.4.51 In summary, baseline provision of dental care in Rochdale is at an adequate level. Sensitivity for local provision of dentistry is considered to be low.

Open Space

10.4.52 The Provision of Recreational Open Space in New Housing Supplementary Planning Document (SPD), updated in January 2017 by Rochdale Borough Council, provides the

²³ As stated in 16.8.13.

following guidelines for requirements for the provision of recreational open space for sites in the borough of Rochdale. The guidelines state that²⁴:

- For developments of more than 10 dwellings (and those of 10 dwellings or less with a combined gross floorspace of more than 1000 square metres) with less than 100 bedrooms in total there will be no need to make provision for recreational open space on-site. However, there will be expected instead to make a financial contribution towards the provision / improvement of an area or areas of recreational open space in the locality.
- For developments of 100 or more bedrooms, there should normally be Local Open Space provision on-site. The area required on-site would be calculated using the Council's provision standards, specifically 1 hectare per thousand bedrooms. This on-site Local Open Space should normally include children's play facilities relating broadly to the following standards:
 - Developments of 100-399 bedrooms: LAP (Local Area for Play).
 - 400-899 bedrooms: LEAP (Locally Equipped Area for Play) + facilities for older children.
 - 900 bedrooms +: NEAP (Neighbourhood Equipped Area for Play) with multi-use games area + facilities for younger children.

10.4.53 The Hollingworth Road land parcel is set to accommodate a total of 312 residential dwellings, which equates to a total number of 1,051 bedrooms. Therefore, it is expected that there would be Local Open Space provision on-site at least in accordance with the Council's standard of 1 hectare per 1000 population, including a children's play area to NEAP standards with multi-use games area and provision for younger children. Outdoor Sports Provision should be located on-site at least in accordance with the Council's standard of 1.1 hectares per 1000 population, unless the Council considers it to be more appropriate to accept a contribution towards off-site improvement / provision calculated in accordance with the Council's standards instead²⁵.

10.4.54 There are currently no published Open Spaces Strategy or audit of recreational public open space in the borough therefore making it impossible to assess how the delivery of the Hollingworth Road land parcel would impact on open space provision across the borough. However, there does appear to be significant areas of open space in proximity to the land parcel, as shown in **Appendix H.1**, with details provided in **Table 10.13** for the key sites of public open space. In summary, open space provision within the study area includes:

- Approximately 3,100m² of allotments at Brooklyn Avenue.
- Approximately 72,000 m² of open public green space spread around the area. Additional public space is available around the lake.

²⁴ [provision-of-recreational-open-space-in-new-housing-spd \(rochdale.gov.uk\)](https://www.rochdale.gov.uk/development-and-planning/planning-and-building-control/planning-policy-and-procedure/planning-policy-and-procedure-2016/provision-of-recreational-open-space-in-new-housing-spd)

²⁵ [provision-of-recreational-open-space-in-new-housing-spd \(rochdale.gov.uk\)](https://www.rochdale.gov.uk/development-and-planning/planning-and-building-control/planning-policy-and-procedure/planning-policy-and-procedure-2016/provision-of-recreational-open-space-in-new-housing-spd)

Table 10.13 Key Public Open Space within 1km of the Hollingworth Road land parcel

Open Space	Address	Description	Distance from site ²⁶
Allotments			
Brooklyn Avenue Allotments	Brooklyn Ave, Hurstead, Rochdale OL16 2SG	Approximately 3,100m ² of allotment near a housing estate	1km
Natural and semi-natural open space			
Cleggswood Avenue Playing Fields	Cleggswood Avenue, Littleborough, OL15 0DF	Approximately 25,000 m ² of open green space	0.1km
Barkers Wood, Public Recreational Woodland Area	Hillview, Starring Rd, Littleborough, OL15 8HN	Approximately 33,000 m ² of open green space	0.7km
Spring Thyme Fold Playing Fields	Spring Thyme Fold, Littleborough, OL15 8DJ	Approximately 14,000 m ² of open green space	0.7km
Hollingworth Lake	101A Hollingworth Rd, Littleborough, OL15 0AZ	Area surrounding the lake. Starts on-site boundary and continues around the lake.	Adjacent to site up until 1km

Labour market and business

Economic Activity

10.4.55 The Greater Manchester area has an economic activity rate (75.3%) and employment rate (71.9%) lower than the regional and national averages. Greater Manchester also has an unemployment rate 0.6 and 0.7 percentage points higher than the regional and national averages respectively. Additionally, Greater Manchester has a higher rate of economic inactivity than both the regional and national figures; 1.4 and 3.7 percentage points higher respectively.

Table 10.14 Economic Activity and Inactivity

Economic Activity & Inactivity	Greater Manchester (%)	North West (%)	England (%)
Economic activity rate - aged 16-64	75.3	76.7	79.0
Employment rate - aged 16-64	71.9	73.8	76.0
Unemployment rate - aged 16-64	4.5	3.9	3.8
Economically inactive - aged 16-64	24.7	23.3	21.0

Source: Annual Population Survey – 12 months to December 2023, ONS (2024)

Industry

10.4.56 The Greater Manchester economy is dominated predominately by the service sectors, with key sectors in wholesale and retail trade; repair of motor vehicles and motorcycles (14.4%), and human health and social work activities (13.9%). Two other significant sectors are professional, scientific, and technical activities, and administrative and support service activities, which account for 11.7% and 9.7% of employment respectively.

²⁶ The distance from the site is calculated on a direct line approach and does not take account of distances using the highway or public footpaths.

10.4.57 The Greater Manchester economy is shown to have a greater proportion of employment (over 2 percentage points higher) within professional, scientific, and technical activities than both the North West and England.

10.4.58 In contrast, the Greater Manchester economy is shown to have lower employment within the manufacturing sector than the North West and England.

Table 10.15 Industry of Employment (Percentages)

Sector	Greater Manchester (%)	North West (%)	England (%)
Agriculture, forestry, and fishing	0.2	1.1	1.3
Mining and quarrying	0.0	0.1	0.1
Manufacturing	7.0	8.8	7.4
Electricity, gas, steam, and air conditioning supply	0.3	0.3	0.3
Water supply; sewerage, waste management and remediation activities	0.5	0.7	0.7
Construction	4.9	5.2	4.9
Wholesale and retail trade; repair of motor vehicles and motorcycles	14.4	14.7	14.0
Transportation and storage	4.8	4.7	5.1
Accommodation and food service activities	7.0	7.9	7.9
Information and communication	4.3	3.3	4.7
Financial and insurance activities	2.8	2.4	3.3
Real estate activities	2.0	1.8	2.0
Professional, scientific, and technical activities	11.7	9.4	9.5
Administrative and support service activities	9.7	8.2	9.0
Public administration and defence; compulsory social security	4.6	4.8	4.2
Education	8.0	7.8	8.3
Human health and social work activities	13.9	14.8	12.9
Arts, entertainment, and recreation	1.9	2.1	2.4
Other service activities	1.9	1.9	2.0
Undifferentiated goods-and services-producing activities of households for own use	0.0	0.0	0.0
Activities of extraterritorial organisations and bodies	0.0	0.0	0.0

Source: Business Register and Employment Survey, ONS (2022)

Productivity

10.4.59 The productivity of the economy is measured by Gross Value Added (GVA). The Gross Value Added per worker per job filled in Greater Manchester is £67,186, lower than the average for England but considerably greater than the average for the North West (by £7,527) .

Table 10.16 GVA Per Job Filled

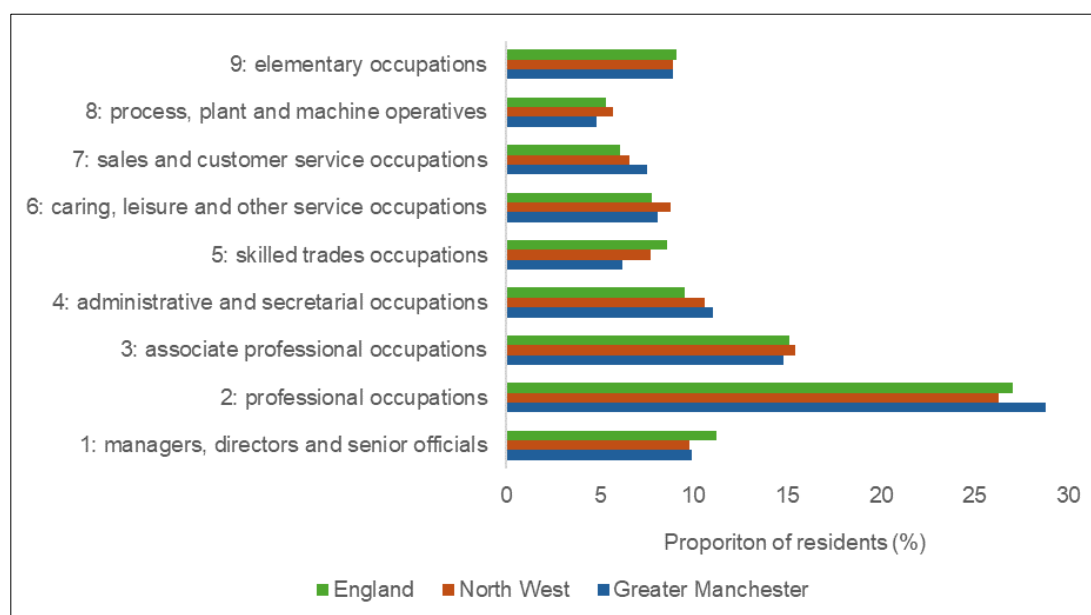
Area	Gross Value Added per job filled (£)
Greater Manchester	£67,186
North West	£59,660
England	£67,790

Source: Productivity, GVA per filled job, ONS (2021) *uplifted to 2024 prices

Occupations

10.4.60 Greater Manchester's occupational profile is reflective of high value employment. Nearly a third of the population are employed within professional occupations, which exceeds both the regional and national average. A total of 9.9% of the population are employed as manager, directors and senior officials, and 14.8% are employed in associate professional occupations, both of which are broadly in line with the regional and national average, although there is 1.3 percentage point lag behind England in managers, directors and senior officials.

Figure 10.3: Percentage of all employment by occupation



Source: Annual Population Survey – 12 months to December 2023, ONS (2024)

Wages

10.4.61 An analysis of the Annual Survey of Hours and Earning identifies the variations in wages that exist between Greater Manchester and the national and regional average, with the mean pay in Greater Manchester being £740.90 per week. This is approximately 0.7% higher than the regional average (£746.80) and 8.1% lower than the national average (£812.40). The annual percentage change in wages in Greater Manchester (5.8%) is lower than the recorded regional and national annual percentage change (6.4%), but consistent with national growth (5.7%).

Table 10.17 Annual Survey of Hours and Earnings

Weekly Pay - Gross	Greater Manchester	North West	England
Number of jobs	804,000	2,107,000	16,457,000
Median Pay	£637.00	£649.00	£683.40
Average annual percentage change - median	6.5%	7.4%	5.4%
Mean Pay	£740.90	£746.80	£812.40
Average annual percentage change - mean	5.8%	6.4%	5.7%

Source: Annual Survey of Hours and Earnings, ONS (2023)

10.5 Future baseline

- 10.5.1 The future baseline, in the period post completion of the Proposed Development, for socio-economic provision is likely to reflect that of the current baseline; this reflects how the area would evolve without this Proposed Development.

10.6 Primary and Tertiary Mitigation

- 10.6.1 The Proposed Development includes provision for a primary school located within the south-eastern part of the Hollingworth Road land parcel, which currently comprises the public car park for visitors to Hollingworth Lake. The school is anticipated to have a floorspace of circa 2,300m² on a plot of circa 2 hectares, which will include playing fields. The school will be a feature building, the height of which will be determined at the detailed design stage (noting that the school part of the Proposed Development is being submitted in outline form). It is intended to be a primary school of up to two-form entry with 30 spaces per class (420 pupils total across Reception and Years 1-6). There is potential for the primary school to provide pre-school / nursery school provision of up to 26 places.

10.7 Assessment of potential effects

Construction Phase

- 10.7.1 **Gross impacts:** The total construction cost of the Proposed Development is estimated to be £57,305,267.95.
- 10.7.2 Analysis of the Business Population Estimates for the UK and Regions (ONS, 2022) found that turnover per worker in the North West construction sector is £173,854. Dividing the total construction costs by the turnover per worker in the construction sector in the North West indicates that the Proposed Development will support a total of 330 gross per year equivalent jobs during the construction phase. Based on an industry standard that equates 10 PYE to 1 FTE, this results in 33 FTE.
- 10.7.3 **Net Additional Impact:** Only a proportion of total construction employment would occur within the Labour Market Study Area due to mobility of labour, competition from externally located construction firms and supply chains. To take account of these factors, the additionality assumptions detailed in **Table 10.17** below have been used to calculate the net construction employment, estimated using the gross construction employment from the proposed development. It should be noted that whilst these calculations are precautionary, the scheme will aim to employ local contractors where possible.

Table 10.18 Construction Additionality Assumptions

Data	Rochdale	UK	Comments
Deadweight	16.5%	0%	Due to cumulative developments delivering a significant number of housing units, deadweight in Rochdale has been calculated at 16.5% to reflect the number of houses being delivered in this scheme. It has been assumed that, in the absence of this intervention, the Hollingworth Road land parcel would remain unchanged and so 0% deadweight has been assumed nationally.
Leakage	31%	0%	A significant proportion of the Hollingworth Road land parcel's workforce (31%) is expected to reside outside of Rochdale based on census 2011 travel to work data. None of the workforce are expected to reside outside of the UK and therefore 0% has been assumed nationally.
Displacement	25%	50%	Given current high levels of demand for construction employment, it has been assumed that there will be some displacement locally and therefore 25% displacement has been used. Nationally it is likely that construction workers will be displaced from other construction projects and therefore a medium level of displacement has been assumed (50%)
Multiplier	1.25	2.7	Multipliers have been sourced from the HCA Additionality Guide Fourth Edition 2014. A local composite multiplier of 1.25 has been used for Rochdale based upon an average sub-regional composite multiplier outlined in BEIS additionality guidance. A national composite multiplier of 2.7 has been applied based on a national construction sector average produced by Oxford Economics.

Source: Stantec

- 10.7.4 Using the additionality assumptions from the table above, the 33 gross temporary construction per year equivalent jobs created by the proposed development in Littleborough are expected to support approximately 18 FTE (178 net per year equivalent jobs) in Rochdale and 45 FTE (445 net additional per year equivalent jobs) in the UK over the construction sector period within the assessed labour market.
- 10.7.5 The construction phase sensitivity on jobs is considered to be **low** due to the availability of skills and labour within the Greater Manchester region. A **low** beneficial magnitude of change is generated as the change in employment is less than 50 at the local level. This results in a **Minor - Negligible** effect of temporary duration.

Operational Phase

Homes

- 10.7.6 The Proposed Development provides approximately 51% of Rochdale Borough Council's minimum annual average housing requirement for the period 2022-2039 set out within PfE Policy JP-H1 ('Scale, Distribution and Phasing of New Housing Development')²⁷. The sensitivity on homes is considered to be **low**, given that the annual average housing requirement for Rochdale identified in PfE is 616 dwellings, and in 2023, 770 permanent dwellings were completed²⁸, a surplus of 154. The magnitude of change is considered to be **medium**, given its contribution to the annual housing target, and the contribution of affordable homes (47 dwellings, equating to 15% of the development). Overall, the Proposed Development will have a **Minor** effect on the provision of homes.

²⁷ [places-for-everyone-joint-development-plan-document.pdf \(greatermanchester-ca.gov.uk\)](#)

²⁸ DLUHC (2024). Housebuilding: permanent dwellings started and completed, by tenure and district, Q1-Q4 2023.

Education

- 10.7.7 To inform the assessment on education effects the child yield associated with the proposed development has been calculated with reference to an assumed housing mix.

Table 10.19 Child Yield from the proposed development

	2 Bed	3 Bed	4 Bed	5 Bed	Total
Nursery Yield Ratio	0.07	0.07	0.06	0.06	-
Primary Child Yield Ratio	0.27	0.39	0.39	0.39	-
Secondary Child Yield Ratio	0.11	0.18	0.39	0.39	-
Housing Mix (%)	10.16	44.26	40.98	4.59	100
Dwellings	31	147	122	12	312
Nursery Places	2.23	10.98	7.49	0.74	21.44
Primary Places	8.40	57.63	47.09	4.63	117.75
Secondary Places	3.54	26.18	48.16	4.74	82.62
Total	14.17	94.80	102.74	10.11	221.81

Source: Stantec

- 10.7.8 **Table 10.18** summarises the increased demand for nursery, primary and secondary school places arising from the Proposed Development. Assuming 30 pupils per form, four-year groups in nursery, seven-year groups in each primary school and five in a secondary school, the Proposed Development generates a need for:

- 21 nursery places.
- 118 primary school places, equating to 3.9 (4) forms of primary provision.
- 83 secondary school places, equating to 2.8 (3) forms of secondary provision.

- 10.7.9 The sensitivity of nursery school provision is considered to be high due an existing shortfall of places. The baseline assessment showed that the number of children subscribed to local nurseries exceeded capacity by 68 places. The proposed development is expected to generate demand for an additional 21 places, bringing oversubscription to 89 places. The introduction of a 26-place nursery class within the proposed primary school will reduce the net oversubscription to 63 places. The magnitude of the change is considered to be **low** due to increasing net capacity by 5 places, resulting in a **–Moderate – Minor** effect.

- 10.7.10 The sensitivity of primary school provision is considered to be low due to an existing surplus of places. The baseline assessment showed that the number of children subscribed to local primary schools fell short of net capacity by 105 places, despite 6 schools running over capacity. The proposed development is expected to generate demand for an additional 118 places, bringing subscription to 13 places below existing capacity. The proposed addition of a primary school²⁹ will provide an additional 420 primary school places, increasing the net undersubscription to 407 places. Whilst this is significantly below the future local capacity, it will contribute to futureproofing primary provision following other housing developments, such as those outlined **Volume 1: Chapter 10**. The magnitude of the change is considered to be **high** due to impact being important at a local scale, resulting in a **Moderate – Minor** effect.

²⁹ Assumed to be 2 form entry as a worst-case scenario for the purposes of this impact assessment.

- 10.7.11 The sensitivity of secondary school provision is considered to be high due to an existing shortfall of places. The baseline assessment showed that the number of children subscribed to local secondary schools exceeded capacity by 112 places. The Proposed Development is expected to generate demand for an additional 83 places, taking net oversubscription to 195 places. The magnitude of the change is considered to be **medium** due to impact being important at a local scale, resulting in a **Major – Moderate** effect.
- 10.7.12 The primary school and adjoining nursery will support a gross figure of 24 FTE per annum³⁰, after accounting for additionality³¹, the development would generate 8 FTE net additional jobs.

Health Facilities

- 10.7.13 There are a total of 312 new residential units proposed as part of the Proposed Development that are forecast to add approximately 833 new people to the local area³². The baseline identified that some GP surgeries within the local integrated care board for the proposed development are over capacity although the total area GP / patient ratio stands at 1,581; which is considerably lower than the NHS benchmark. The sensitivity of GP surgeries is therefore considered to be **low**.
- 10.7.14 The introduction of an additional 833 new residents would have a **medium** impact on GP provision given the changes will be important at the local scale, creating a **Minor** effect, which is considered significant.
- 10.7.15 NHS Dental Statistics for England show there were 24,272 dentists performing NHS activity in England during 2021-22 providing an average of 2,329 people per NHS dentist or 0.43 dentists per 1,000 population³³.
- 10.7.16 Based on the population generated by the scheme the sensitivity is considered to be **low**, as demand for 0.36 dentists will be generated, hence no additional dentists will be required. A **low** level of impact on dentist provision is expected given the changes will occur at the local level. Comparing against the baseline condition of 106 Dental Practitioners in Rochdale. The development will bring the Rochdale population to an estimated total of 226,066 people. This equates to 2,133 people per Dental Practitioner, significantly less than the average for England. The Proposed Development will therefore lead to a **Minor - Negligible effect** on provision of dental practitioners.

10.8 Secondary Mitigation and Enhancement

- 10.8.1 As no secondary mitigation and enhancements are proposed in regard to socio-economics, the residual effects are anticipated to be the same as the potential effects reported above.

10.9 Cumulative effects

- 10.9.1 Please refer to Volume 1: Chapter 10 for the cumulative effects assessment including the Hollingworth Road land parcel and the Rakewood Road land parcel.

³⁰ In line with pupil staff ratios for Rochdale primary schools, published by UK Government for 2022.

³¹ Cautious assumption of deadweight (10%), displacement (50%), and leakage (25%).

³² This is based on the multiplying of the number of new units split by number of bedrooms by the estimated number of people living in a household as per Census 2011 data (DC4405EW). This was calculated at a local authority level.

³³ Population per Dentist based on NHS dentist numbers and the Mid-Year Population estimate for England. Source: Office for National Statistics, 2021.

10.10 Monitoring

- 10.10.1 There are significant residual socio-economic effects for education and healthcare; however, these effects cannot be monitored by Bloor Homes. Bloor Homes will discuss potential contributions to this process with the LPA.

10.11 Consideration of Climate Change

- 10.11.1 Climate change is expected to increase the need for open space due to the potential degradation of existing provision. Additionally, the impact of climate change will be partially realised in the effect on public health. In this sense, there will be an increased need for GP care. These residual effects from climate change will exacerbate these respective effects highlighted within the impact assessment.

10.12 Conclusions

- 10.12.1 This chapter has assessed the socio-economic impacts associated with the Proposed Development comprising 312 residential units, of which 47 are for social rent (15%). The proposed development will also provide a new primary school located within the south-eastern part of the Hollingworth Road land parcel, which currently comprises the public car park for visitors to Hollingworth Lake. For the purpose of this impact assessment, the primary school has been assumed to be of up to two-form entry with 30 spaces per class (420 pupils total across Reception and Years 1-6) and a 26-space nursery.
- 10.12.2 There is no legislation relating to the assessment of socio-economic impacts. However, this chapter has been developed within the context of relevant policy documents including the National Planning Policy Framework; Planning Practice Guidance and local planning policy such as the Rochdale Core Strategy and the PfE Plan.
- 10.12.3 This socio-economic assessment has been developed through the identification of current and future baseline conditions; an assessment of the likely significant effects; recommended mitigation and an assessment of the residual effects post mitigation. The scope of this assessment includes temporary employment effects generated during the construction and operational phase, in addition to operational stage impacts on housing, education (nursery, primary and secondary), health (GPs and dentists), and open space.
- 10.12.4 With regard to employment effects, the proposed development is expected to support 18 FTEs during the construction phase (3 years), and an annual figure of 8 net additional staff during the operational phase of the proposed primary school.
- 10.12.5 The Proposed Development is expected to have a **Minor** effect to housing provision in Rochdale, due to achieving 51% of the PfE annual average new dwellings, 15% of which will be affordable housing.
- 10.12.6 Nursery school provision in the Education Study Area is offered at 11 settings, with capacity for 583 places. Over half of the providers are currently over capacity resulting in a total enrolment exceeding capacity by 68 places.
- 10.12.7 The development will introduce a further need for 21 nursery places. However, the development will also see the introduction of a new primary school with adjoining nursery class. The capacity of the nursery class has not yet been determined. For assessment purposes it has been assumed that a minimum of 26 places will be provided. The net effect will see nursery oversubscription reduce from a 68 place baseline to 63, post development. The development will accordingly have a **Moderate – Minor** effect on local nursery provision.

- 10.12.8 Primary school provision in the Education Study Area is offered at 17 settings, with capacity for 5,354 places. Demand is met at present, with 105 places spare capacity. Some primary schools identified are shown to be over or nearing capacity. However, others show significant capacity with 20 or more places available at 4 out of 17 local primary schools; Littleborough Community Primary School and Nursery has spare capacity for over 100 pupils.
- 10.12.9 The development will introduce a further need for a further 118 primary school places, approximately 4 forms. However, the development will also see the introduction of a new primary school, the capacity of which has not yet been determined. For assessment purposes, it has been assumed that the primary school will be 2 form entry at a minimum, with capacity for 420 pupils across reception and Year 1 – 6. The net effect will result in 407 pupil spare capacity within the Education Study Area. The development will accordingly have a **Moderate – Minor** effect on local primary school provision.
- 10.12.10 Secondary school provision in the Education Study Area is offered at 4 settings, with capacity for 5,218 places. At present subscription is exceeding demand by 112 places, with only Hollingworth Academy operating under pupil capacity.
- 10.12.11 The development will introduce a further need for 83 secondary school places, approximately 3 forms; taking net oversubscription to 195 pupils. The development will accordingly have a **Major – Moderate** effect on local secondary school provision.
- 10.12.12 There are 15 GP practices that have patient loads above the 1,800-patient per NHS GP benchmark identified within the Healthy Urban Development Unit (HUDU)'s model³⁴ suggesting these practices are operating at full capacity. Across the integrated care board, there is an average of 1,581 patients per general practitioner (GP).
- 10.12.13 The Proposed Development will see the introduction of an estimated 833 people, this will increase the ratio from 1,581 patients per GP, to 1,586 patients per GP. This is far below the 1,800 ratio benchmark for the UK. There is accordingly a **Minor** effect from the development on local GP provision.
- 10.12.14 Similarly, the baseline for provision of dentists is 1 dental practitioner (DP) per 2,111 population. The proposed development will bring this ratio to 1 DP per 2,119 population. However, the national benchmark for this ratio is 1 DP to 2,329 population. Therefore, the development will only have a **Minor - Negligible** effect.
- 10.12.15 For developments of 100 or more bedrooms, there should normally be Local Open Space provision on-site. The area required on-site would be calculated using the Council's provision standards, specifically 1 hectare per thousand bedrooms. This on-site Local Open Space should normally include children's play such as a local area for play for development of between 100-299 bedrooms.

³⁴ Source: Healthy Urban Development Unit, (2009). HUDU Model

11 Climate Change

11.1 Introduction

11.1.1 This chapter presents the findings of assessments of the likely significant effects on:

- the impact of the proposed development on climate change ('Greenhouse Gas Emissions Assessment'); and
- the impact of climate change on the proposed development ('Climate Change Risk Assessment').

11.1.2 These assessments have different policy contexts, guidance documents, methodologies, baseline conditions, potential impacts and mitigation measures. This chapter therefore presents the Greenhouse Gas Emissions Assessment and Climate Change Risk Assessment separately. Following this introduction, this chapter is structured as follows:

- **Part 1: Greenhouse Gas (GHG) Emissions Assessment** – a qualitative assessment of the proposed development's impacts on climate change by its potential to emit GHGs. This section also outlines what mitigation measures have been embedded within the proposed development to reduce GHG emissions during construction and operation.
- **Part 2: Climate Change Risk Assessment (CCRA)** – outlines the projected climatic changes in the region, identifies receptors vulnerable to climate change, and the mitigation measures to address climate change, embed adaptation measures and improve resilience.

11.1.3 This chapter has been prepared by Stantec UK Limited (Stantec). In accordance with Regulation 18(5) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, a statement outlining the relevant expertise and qualifications of competent experts appointed to prepare this ES is provided in Volume 1: **Appendix D**.

11.1.4 For context and further information regarding the mitigation outlined in this chapter, this ES Chapter should be read alongside other technical chapters within this ES including **Chapter 2: Ecology and Biodiversity**, **Chapter 3: Landscape and Visual**, **Chapter 7: Traffic and Transport** as well as the **Energy Statement (Briary Energy, 2024)** submitted with the planning application.

11.1.5 The appendices associated with this chapter are:

- **Appendix I.1:** Climate Change Policy and Guidance
- **Appendix I.2:** Climate Projections Data

Part 1: Greenhouse Gas Emissions Assessment

11.2 Policy Context, Legislation, Guidance and Standards

11.2.1 The following legislation and policy has informed the assessment of effects within this section. Further details are provided in **Appendix I.1**.

- **Climate Change Legislation**, including Town and County Planning (Environmental Impact Assessment) Regulations (2017); Climate Change Act (2008) (2050 Target Amendment) Order 2019, Carbon Budget Orders (2009, 2011, 2016 and 2021).

- **International Agreements**, including the Paris Agreement (2015) and United Nations Climate Change Conference – COP26 Glasgow (2021), COP27 Sharm el Sheikh (2022).
- **National Planning Policy**, including Planning Policy Statement 1 (Supplement) (2009), National Planning Policy Framework (NPPF, 2023) and Planning Practice Guidance (PPG, 2021).
- **Policy Papers**, including the Transport Decarbonisation Plan (2021), Net Zero Strategy (2021), Ten Point Plan for an Industrial Revolution (2020), Powering up Britain (2023), The Road to Zero (2018), and Clean Growth Strategy (2017).

Local Policy

- 11.2.2 The Hollingworth Road land parcel lies within the administrative council of Rochdale Borough Council (RBC).

Core Strategy

- 11.2.3 The Core Strategy was adopted by RBC on 19th October 2016. The following policies are relevant to the climate change chapter:

Policy G1: Tackling and Adapting to Climate Change

“We will address climate change and ensure growth does not increase CO₂ emissions.

New developments will be expected to:

- *Be zero carbon in line with national targets and definitions;*
- *Adhere to the ‘energy hierarchy’, being designed in such a way that ensures that buildings require the minimum amount of energy to function over their lifetime;*
- *Reduce CO₂ emissions through the use of renewable and low carbon decentralised energy technologies and networks. This will be through both on-site provision in new developments and through connection to local networks.*
- *Address the impacts of climate change by incorporating comprehensive adaptation measures.”*

Policy C6: Improving Health and Well Being

“We will achieve this through:

- *Managing and mitigating the effects of climate change by tackling greenhouse emissions, reducing risks of flooding, promoting tree planting and seeking to avoid adverse micro-climates.”*

Climate Emergency

- 11.2.4 In July 2019, RBC declared a climate emergency. This acknowledges that the Council has a responsibility to take meaningful action to reduce carbon emissions, alongside preparing the borough for the impacts of a changing climate.
- 11.2.5 The Council has developed a Climate Change Strategy and Delivery Plan, which outlines the urgent actions needed to achieve environmental sustainability. This strategy was

developed with the Climate Emergency Working Group and was formally approved by the Cabinet on 29 March 2022.

- 11.2.6 The strategy includes an overview of the climate crisis and sustainability, national and regional climate change policy positions, sustainable development goals, collaborative action, council responsibilities, resources, governance, engagement and communications, and measuring progress.
- 11.2.7 RBC has set a target for both the Council and the borough to become carbon neutral by 2038. The strategy and plan are a partnership for the borough, setting out how the borough can reach its objective of becoming carbon neutral. The Council is committed to tackling climate change, and their sustainability goals reflect this commitment.
- 11.2.8 RBC's Climate Action Plan, part of its Climate Change Strategy and Delivery Plan, identifies the urgent actions needed to achieve environmental sustainability. The Action Plan is a comprehensive approach to tackling climate change at the local level, with a strong focus on collaboration, sustainability, and measurable progress.

Places for Everyone (PfE)

- 11.2.9 The PfE Plan took effect and became part of the statutory development plan for each of the nine PfE authorities on 21 March 2024. Policy JP-S6: Resource Efficiency is relevant to Part 1 of the ES chapter:

"The achievement of a circular economy and a zero-waste economy will play a key role in meeting Greater Manchester's ambition of becoming a leading green city region by 2038. The following measures will help achieve this:

- *...Using sustainable design and construction techniques to reduce carbon emissions, adapt and future proof to the impact of climate change, reduce and recycle waste and minimise water use."*

Guidance

- 11.2.10 Several standards and guidance documents have been used to inform the GHG emissions assessment methodology and the CCRA methodology. Full details of how the following documents have been considered in this chapter is provided in **Appendix I.1**.
- Environmental Impact Assessment (EIA) Guidance on assessing greenhouse gas emission and significance (IEMA, 2022).
 - Publicly Available Standard (PAS) 2080:2023 Carbon management in Infrastructure (British Standards Institute (BSI), 2023).
 - World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI) Greenhouse Gas Protocol guidance (WBCSD and WRI, 2004).

11.3 Consultation

- 11.3.1 The EIA Scoping Report identified the proposed scope and approach of the GHG Emissions Assessment. The scoping report stated that the assessments will draw on IEMA guidance (2022) to determine significance of effects. RBC's scoping opinion confirmed the need to scope climate change into the Environmental Statement. No further comments were made on the assessment approach within the scoping opinion.

11.4 Methodology

Study Area

- 11.4.1 The GHG emissions assessment study area includes the Hollingworth Road land parcel and extends to include activities that occur beyond the land parcel's boundary, such as the generation of electricity off-site. As GHG impacts are global and cumulative with all other sources of emissions, no specific geographical study area is defined for the identified GHG emission sources that are set out in **Table 11.1**.

Baseline Data Collection

- 11.4.2 A high-level review of existing land use and associated activities on-site has been undertaken to identify the 2021 baseline GHG emissions, as the most up-to date available figures. RBC and national baseline GHG emissions have been identified through a review of the UK Carbon Budget Orders and UK local authority GHG inventory data (DESNZ, 2023).

Sensitive Receptors

- 11.4.3 GHG emissions have a global effect rather than directly affecting specific local receptors to which levels of sensitivity can be assigned. The global climate has therefore been treated as a single receptor. Given the global scale and severe consequences of climate change and limited recoverability, the receptor sensitivity is considered to be high.

Assessment

- 11.4.4 There is no nationally adopted method for assessing climate change within EIA and therefore the assessment approach draws upon IEMA guidance (IEMA, 2022). It identifies that all new GHG emissions contribute to a negative environmental impact and contribute to climate change, thus might be considered significant. It therefore suggests the impact of a development on climate should be based on its potential to emit GHGs.
- 11.4.5 IEMA guidance emphasises the need for proportionality in the context of national, sector and local GHG emissions. Given the hybrid nature of the application, a qualitative approach to assessing the GHGs of the proposed development has been undertaken. The guidance recognises that qualitative assessments are acceptable, particularly where mitigation measures are agreed early on in the design stage and is agreed during the EIA scoping stage with stakeholders. The sources of emissions that are considered within this assessment, in line with IEMA Guidance, are discussed in **Table 11.1**.
- 11.4.6 Several measures to reduce GHG emissions associated with the construction and operation of the proposed development have been embedded into the developments design.
- 11.4.7 The GHG Protocol (WBCSD and WRI, 2019) categorises direct and indirect emissions into three broad scopes:
- Scope 1: all direct GHG emissions;
 - Scope 2: indirect GHG emissions from the generation of purchased electricity, heat, or steam; and
 - Scope 3: other indirect emissions, such as the extraction and production of purchased materials and fuels, electricity-related activities not covered in Scope 2, outsourced activities, waste disposal, etc.

11.4.8 In addition, PAS 2080 (BSI, 2023) defines lifecycle modules. The scope of the GHG Emissions assessment using the GHG Protocol and PAS 2080 lifecycle stages is set out in **Table 11.1** and within **Appendix I.1**.

Table 11.1 GHG Emissions Sources and Qualitative Scope

Stage of Development	GHG Protocol	Activity Assessed
Demolition/ Construction Lifecycle Stages A1-A5 (PAS 2080)	Scope 1	Construction processes such as emissions resulting from the combustion of fuels for vehicles, plants or equipment used for construction of the proposed development and emissions released by soil movement and land disturbance.
	Scope 2	Emissions associated with electricity needed for plant and welfare facilities.
	Scope 3	Emissions associated with the embodied carbon of all purchased materials used to construct
Operation Lifecycle Stages B1-B9 (PAS 2080)	Scope 1	Emissions associated with transport.
	Scope 2	Emissions associated with purchased electricity from the National Grid and distribution network during operation of the proposed development, for example, emissions associated with operational energy use.
	Scope 3	Emissions associated with waste disposal, water supply and treatment.

11.4.9 Due to the nature of the proposed development (mixed-use residential led), it has not been designed with a fixed lifetime and therefore the end-of-life stage, or demolition, is difficult to define. In addition, it is anticipated that the construction and operation of the proposed development will have the greatest potential to emit GHGs compared to the end-of-life stage, particularly when considering the trend of national decarbonisation³⁵ over time and the legislative requirement for the UK to meet carbon neutral targets by 2050. It is therefore anticipated that, when the proposed development will reach end-of-life, there will be a zero-carbon economy and principles for a circular economy will be utilised. Emissions associated with the end-of-life stage of the proposed development are therefore scoped out of the assessment.

11.4.10 A review has been undertaken of relevant reports that will be submitted with the planning application including the **Energy Statement** (Briary Energy, 2024). Where information from outside the ES has been considered, all relevant information to inform the assessment of likely significant effects on the environment has been summarised within this chapter.

Determining Significance

11.4.11 Significance of effects have been determined using professional judgement, and consideration of the following elements:

- IEMA EIA Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022).
- Appraisal of the proposed development's emissions in the context of national, regional and local emissions through establishing the current and future baseline.

³⁵ . The increasing share of low carbon, renewable energy sources with a corresponding decrease in the use of fossil fuels, is termed "decarbonisation".

- How the proposed development has embedded design features to reduce GHG emissions and identified opportunities for further (secondary) mitigation in the proposed development's design and delivery.

11.4.12 IEMA guidance (2022) identifies that all GHG emissions contribute towards climate change. It identifies three underlying principles to inform the assessment of significance:

- "The GHG emissions from all projects will contribute to climate change, the largest interrelated cumulative environmental effect;
- The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive (e.g. human health, biodiversity, water, land use, air quality);
- GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit; as such any GHG emissions or reductions from a project might be considered to be significant."

11.4.13 Key to determining significance is setting a context for the magnitude of GHG emissions. The relevant context here are the national carbon budgets which defines a level of GHG emissions that would result in dangerous climate change. The UK has set a legally binding GHG reduction target for 2050 which, according to the Climate Change Committee (CCC), is compatible with the magnitude and rate of GHG emissions reductions required in the UK to meet the goals of the Paris Agreement. **Appendix I.1** provides further detail on policy requirements including the Paris Agreement and 2050 Target.

11.4.14 IEMA (2022) states that EIA for any proposed project must give proportionate consideration to whether and how that project will contribute to or jeopardise the achievement of these targets. A project's impact can shift from significant adverse to non-significant effects by incorporating mitigation measures that substantially improve on 'business-as-usual' and meet or exceed the science-based emissions trajectory of ongoing but declining emissions towards net zero. IEMA (2022) states that:

"The crux of significance is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050.

Often a project will cause a change in GHG emissions compared to the baseline which should be assessed. When setting this impact into context to determine significance, it is important to consider the net zero trajectory in line with the Paris Agreement's 1.5°C pathway."

11.4.15 It is a practitioner's professional judgement on how best to determine whether a project is supporting a trajectory towards net zero, drawing on the available guidance, policy and scientific evidence. This chapter therefore deviates from the standard EIA methodology set out in Volume 1: **Chapter 6 Assessment Method**. The methodology is in line with IEMA (2022) guidance, as set out in the scoping report (Volume 1: **Appendix F**). **Table 11.2** demonstrates how to distinguish different levels of significance under IEMA (2022) guidance, which has been applied to the assessment in this chapter.

Table 11.2 GHG Significance (IEMA, 2022)

Significance	Measure of Impact
Major Adverse	The project's GHG impacts are not mitigated or are only compliant with do-minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
Moderate Adverse	The project's GHG impacts are partially mitigated and may partially meet the applicable policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
Minor Adverse	The project's GHG impacts would be fully consistent with applicable policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
Negligible	The project's GHG impacts would be reduced through measures that go well beyond policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions
Beneficial	The project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without-project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

11.4.16 Major or moderate adverse effects and beneficial effects are considered to be 'significant'. Minor adverse and negligible effects are considered to be 'not significant'.

Limitations

11.4.17 Given the hybrid nature of the application, the assessment has been based on high-level information outlined in Volume 1: **Chapter 3** of the ES. This has been taken into consideration through the use of a qualitative approach to assessing the GHGs of the proposed development.

11.4.18 The trajectory of GHG emissions into the future is dependent on influences outside of the applicant's control, for example, Government policy and global technology and economic shifts, which are difficult to predict. The UK carbon budgets are legally binding, and the Government have an array of policies and levers to be deployed if the carbon budgets are not likely to be met.

11.4.19 It is important to note that whilst it is not considered a form of mitigation, emissions from transport and energy are predicted to decline in the coming decades and this is considered within the GHG assessment. This assessment has assumed that the uptake of electric vehicles (EVs) and the decarbonisation of the National Grid will occur as set out in national strategies that have been adopted by the UK Government. For example, the uptake of EVs and hydrogen is anticipated to increase in line with Government policies, as petrol and diesel car sales will be banned by 2035. It is therefore assumed that an increase in EV uptake will result in a reduction in transport emissions associated with the proposed development in the long term, as vehicles will be powered by lower (or zero) emitting electricity sources.

11.5 Baseline Conditions

Current State of the Environment

National and Regional Emissions

- 11.5.1 This section establishes the existing GHG emissions at a national and regional level. GHG emissions do not have a local receptor as, once they are emitted, they are not limited to geographic boundaries.
- 11.5.2 The Climate Change Act 2008, as amended, requires the government to set five-yearly carbon budgets, after taking advice from the CCC. The budgets are fixed in advance and set five-year caps on the total GHG emissions allowed to ensure the UK meets its emissions reductions commitments.
- 11.5.3 The carbon budgets enable net increases in emissions to be managed within the carbon budgets by balancing with performance in other sectors. Governments can use an array of policies and levers to achieve the net reductions necessary to meet the carbon budgets whilst taking an economy-wide and national approach to securing overall emissions reductions whilst facilitating other objectives including economic growth, energy security and levelling up.
- 11.5.4 **Table 11.3** sets out the UK carbon budgets from 2008 until 2022. Both the first and second carbon budgets were met, culminating in a 31% reduction below 1990 carbon emissions. The third carbon budget has been provisionally met.

Table 11.3 UK Carbon Budget (2008-2022)

UK Budget	Carbon budget level (million tonnes carbon dioxide equivalents - MtCO ₂ e)	Target Reduction below 1990 levels	UK Emissions
1st carbon budget (2008 to 2012)	3,018 MtCO ₂ e	25%	2,982 MtCO ₂ e
2nd carbon budget (2013 to 2017)	2,782 MtCO ₂ e	31%	2,398 MtCO ₂ e
3 rd carbon budget (2018 – 2022)	2,544 MtCO ₂ e	37%	2,327 MtCO ₂ e*

**This figure is provisional based on the CCC 2023 Progress Report, final emissions are yet to be published.*

- 11.5.5 From a national perspective, in 2021 UK total GHG emissions were estimated to be 426.5 million tonnes carbon dioxide equivalents (MtCO₂e), an increase of 5% compared to 2020 (DBEIS, 2021). National GHG emissions in 2020 had decreased by 48.8% since 1990 (DBEIS, 2021). The increase in 2021 is primarily due to increase in transport after lockdown measures associated with COVID-19 eased, along with increases from power stations and the residential sector.
- 11.5.6 The Department for Business, Energy & Industrial Services (DBEIS, 2023) sets out the CO₂ emissions estimates from a number of sources for 2005-2021 and is the most up to date available figures for the North West and Rochdale. The CO₂e estimates for 2021 are presented in **Table 11.4**.

Table 11.4 National and Local (Rochdale) CO₂e estimates for 2021

	Rochdale	North West
Industry (ktCO₂e)	154.7	10,252.4
Commercial (ktCO₂e)	38.3	1,890.2
Public Sector	34.0	1,797.9
Domestic (ktCO₂e)	311.9	10,885.4
Transport (ktCO₂e)	401.9	12,065.4
Land Use, Land Use Change and Forestry (ktCO₂e)	-0.4	287.1
Agriculture (ktCO₂e)	19.1	4,567.4
Waste Management (ktCO₂e)	16.5	2,301.3
Total (ktCO₂e)	975.9	44,047.0

- 11.5.7 Rochdale accounts for approximately 1.5% of the emissions of the North West. The largest source of emissions within Rochdale is Transport (41.2%), followed by Domestic (32.0%) and then Industry (15.9%).

Local Emissions

- 11.5.8 The Hollingworth Road land parcel encompasses 18.85 hectares of agricultural land, which is predominantly used by grazing animals including horses and cattle. Livestock contributes both directly and indirectly towards climate change through the production of GHG emissions such as CO₂, methane and nitrous oxide (Sejian et al. 2016). There is also likely to be machinery in use to support livestock. As a result, there is likely to be a small quantity of direct scope 1 emissions associated with vehicle machinery within the land parcel's boundary.
- 11.5.9 The existing vegetation within the land parcel's boundary likely plays a role in reducing local emissions through a process known as carbon sequestration. This process involves the absorption of carbon dioxide from the atmosphere during photosynthesis. The carbon is then stored within the plant's biomass, effectively removing it from the atmosphere and reducing the overall carbon emissions of the land parcel.
- 11.5.10 There are also farm buildings and a residential building within the land parcel's boundary associated with Lower Cleggswood Farm. There will be a small quantity of emissions associated with the building use, including scope 1 and scope 2 emissions from heating and lighting.

Baseline Evolution

National and Regional Emissions

- 11.5.11 The carbon budget for England for the period 2023-2027 is set to reduce GHG emissions by an average of 51% compared to the 1990 baseline emissions, as set out in **Table 11.5**. The 6th carbon budget, for the period 2033-37, was accepted by the Government in April 2021 and adopted into law in July 2021. It is the first budget to consider the UK's net zero target by 2050 with a trajectory that is consistent with the Paris Agreement. The 2036 future baseline year, when full occupancy is assumed, falls within this carbon budget.

Table 11.5 UK Carbon Budget Targets (2018-2037)

UK Budget	Carbon budget level (million tonnes carbon dioxide equivalents - MtCO ₂ e)	Reduction below 1990 levels
4 th carbon budget (2023 to 2027)	1,950 MtCO ₂ e	51% by 2025
5 th carbon budget (2028-2032)	1,725 MtCO ₂ e	57% by 2030
6 th carbon budget (2033-2037)	965 MtCO ₂ e	78% by 2035

11.5.12 Sources of GHG emissions would include emissions associated with transport. In the future, it is anticipated that emissions from the transport sector will have declined (DBEIS, 2021). In 2018, 97% of final energy consumption in transport was from fossil fuels, however by 2035 this is projected to fall to 93% due to the update of EVs and increased use of biofuels.

11.5.13 In 2018, the UK Government launched the Road to Zero strategy, which sets out its ambition to reduce emissions from vehicles on UK roads and promote the uptake of zero emissions vehicles (DfT, 2018). Proposed support mechanisms to facilitate this transition include increasing the supply and sustainability of low carbon fuels in the UK through a legally-binding 15-year strategy, offering grants for plug-in vehicles and introducing a voluntary industry-supported commitment to reduce Heavy Goods Vehicles GHG emissions by 15% by 2025, from 2015 levels.

11.5.14 In March 2020, the Electric Vehicles and Infrastructure paper was published, which outlined how the infrastructure for EVs have been planned for and what incentives are available to encourage growth. In November 2020, the UK Government announced that the sale of new petrol and diesel cars will be stopped in the UK by 2030 (DfT, 2020) but in September 2023, UK Prime Minister Rishi Sunak pushed the ban on new petrol and diesel cars back to 2035.

11.5.15 Significant investment has been allocated to support the greater uptake of zero emission vehicles, including £1.8 billion to build more charge points, as well as £582 million in grants.

11.5.16 The proposed development will generate emissions associated with purchased electricity from the National Grid during operation, for example, for lighting. The National Grid is currently decarbonising, which is anticipated to continue over the next decade. This is an outcome of the continued uptake of renewable energies and the decline of coal-fired power stations across the UK. Decarbonisation encourages the use of grid-supplied electricity systems, such as air source heat pumps, over gas-fired plant.

11.5.17 Furthermore, technologies generating on-site electricity (such as gas-engine combined heat and power (CHP)) will not achieve the carbon savings they have to date (because they are offsetting less 'carbon' as the grid decarbonises). Therefore, the emissions per unit of electricity generated (grams of carbon dioxide per kilowatt hour) is reducing. The Government's policy paper 'Transitioning to a net zero energy system: smart systems and flexibility plan' (July 2021), see **Appendix I.1**, further supports the decarbonisation of energy across the UK. As a result, GHG emissions within the extant planning consent from elements dependant on grid energy, including EV charging, would reduce.

Local Emissions

11.5.18 If the Hollingworth Road land parcel continues to be used for agricultural purposes without any development, the local emissions produced are likely to remain relatively stable. The

existing vegetation on the Hollingworth Road land parcel would continue to mature and, through the process of photosynthesis, absorb carbon dioxide from the atmosphere.

11.6 Primary and Tertiary Mitigation

- 11.6.1 As noted in Volume 1: **Chapter 3** of the ES and in accordance with Reg 18(3)(c) of the EIA Regulations and guidance from IEMA, this assessment takes account of primary mitigation which is inherent in the proposed development design and tertiary mitigation, which refers to actions that would occur to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.

Primary Mitigation

Construction

- 11.6.2 During the construction of the proposed development, standard best practice measures will be followed to reduce emissions wherever possible. This includes using efficient equipment which is in good working order and reducing waste wherever possible.
- 11.6.3 Recycled materials will be utilised where they can be, with consideration for materials that go through less energy-intensive processes and can be sourced locally. This will help to reduce emissions from embodied carbon. Local construction workers will also be utilised where possible to reduce transport emissions.

Operation

Transport

- 11.6.4 The proposed development incorporates measures to reduce emissions associated with transport. The Hollingworth Road land parcel is located equidistant from the Littleborough and Smithy Bridge railway stations, both of which are within 1-1.2km from the land parcel. The stations offer services to cities such as Leeds, Manchester and York.
- 11.6.5 The following transport measures encourage sustainable transport use:
- Several dedicated pedestrian and cycle routes connecting the proposed development internally and to the surrounding area;
 - Bus stops located on the B6225 Hollingworth Road, within a 400m walking distance;
 - Provision of sustainable transport information in 'School Welcome Packs' to encourage walking, cycling and using public transport over private car use for travel to the school;
 - Clear signage of pedestrian routes within and adjacent to the Hollingworth Road land parcel;
 - Provision of signage to cycle routes in the vicinity of the land parcel;
 - The surrounding area exhibits good levels of pedestrian and cycling infrastructure;
 - Electric Vehicle (EVs) charging facilities to encourage the shift towards EVs over petrol and diesel cars.

Green Infrastructure

- 11.6.6 Green infrastructure can provide a form of carbon sequestration on-site, reducing the level of CO₂ within the atmosphere. The proposed development includes a network of green infrastructure, providing wildlife corridors and links through the Hollingworth Road land parcel, from Rochdale Canal to the north and Hollingworth Lake to the south. Green infrastructure across the proposed development can be seen on the Parameter Plans (see **Appendix C2**).
- 11.6.7 Existing trees and planting will be retained where possible and enhanced by additional landscape treatment through street trees and local green spaces.

Tertiary Mitigation

Construction

Site Waste Management Plan (SWMP)

- 11.6.8 A Site Waste Management Plan (SWMP) will be prepared prior to demolition and construction and is anticipated to be secured via a planning condition. The SWMP will set out managing materials appropriately and reducing waste where possible. This assists in reducing the embodied carbon associated with constructions materials and emissions associated with waste management processes.

Outline Construction Environmental Management Plan (OCEMP)

- 11.6.9 The construction activities will be managed through the implementation of a Construction Environmental Management Plan (CEMP). An Outline CEMP (OCEMP) has been prepared by RSK Ltd and is submitted with the planning application.
- 11.6.10 The OCEMP includes measures related to transport, materials, waste and air quality during construction. Measures that will reduce GHG emissions during construction include, for example, no necessary idling of engines, maintenance of plant equipment to check they are operating optimally and efficient use of materials to reduce waste in line with the waste hierarchy. The measures included in the OCEMP contribute to the mitigation of GHG emissions by reducing energy consumption and waste/pollutant generation during construction, thereby leading to a lower carbon footprint.
- 11.6.11 Other measures, which will be secured through the OCEMP, include:
- Avoiding the use of diesel- or petrol-powered generators, and use mains electricity or battery powered equipment where practicable;
 - Plant equipment to be switched off when not in use;
 - Open fires and burning of waste will be prohibited at all times.

Operation

Energy

- 11.6.12 All dwellings must comply with Building Regulations Part L 2021, which came into effect in June 2022. The new Building Regulations enforce higher fabric performance and therefore more energy-efficient dwellings. It also considers the use of zero and low carbon energy generation at an early stage of the design process. These measures are also considered within the **Energy Statement** (Briar Energy, 2024).

EV Charging Infrastructure

- 11.6.13 EV charging infrastructure will be provided at the proposed development in line with the standards of Building Regulations Part S 2021. This encourages the uptake of EVs and helps reduce the use of petrol and diesel vehicles at the site, which produce direct Scope 1 emissions.

Water Efficiency

- 11.6.14 Measures to reduce water demand and increase water efficiency will be provided in line with the water efficiency standard outlined in Building Regulations Part G 2016 which is 125 litres/person/day. This is expected to include measures such as using dual flush toilets and flow control devices to reduce water consumption and installing water-efficient appliances. This contributes to reducing emissions as water is conserved, reducing the energy used to distribute water.

Landscape and Biodiversity Management Strategy

- 11.6.15 A Landscape and Biodiversity Management Strategy (LBMS) has been produced by Stantec as part of the planning application. The LBMS details the long-term management of planting and protection of biodiversity around the Hollingworth Road land parcel. This helps planting to grow to its full potential and can increase the carbon stored within green infrastructure (sequestration).

Framework Travel Plan

- 11.6.16 A Framework Travel Plan (FTP) has been produced to accompany the Transport Assessment for the planning application. A FTP is the first stage of the Travel Plan process and lists measures which affect modal choice. A management strategy is also included in order to produce a Full Travel Plan in the future.

11.7 Assessment of Likely Effects

- 11.7.1 The assessment of likely effects outlined below consider primary and tertiary mitigation only. Residual effects outlined in **Section 11.9**, account for further mitigation to be discussed with RBC and secured via a Planning Condition or S106 agreement.

Construction

Scope 1

- 11.7.2 The main sources of direct GHG emissions during construction relate to the combustion of fossil fuels during the transportation of building materials and waste by Heavy Goods Vehicles (HGV) to and from the Hollingworth Road land parcel, as well as powering construction plant engines and equipment. The implementation of the CEMP will help to manage and reduce GHG emissions associated with construction vehicles, plant and equipment. The enabling and land clearance activities required for the construction of the proposed development will result in direct GHG emissions released from movement and disturbance of soil on-site.

Scope 2

- 11.7.3 The temporary construction office and welfare facilities for construction workers and temporary lighting on the Hollingworth Road land parcel will require electricity purchased from the National Grid. This will result in indirect GHG emissions generated energy generation to deliver electricity to the National Grid. Construction is anticipated to come

forward as the National Grid continues to decarbonise. Additionally the implementation of a CEMP will help to manage and control the use of electricity on-site.

Scope 3

- 11.7.4 Embodied carbon emissions result from extracting raw materials, processing them, assembling them into usable products and transporting them to site during construction. It is noted that a large proportion of GHG emissions from a development may be accounted for within scope 3 embodied carbon. The embodied carbon associated with the proposed development will be heavily influenced by the type and amount of material required to construct the development. Extraction and production processes can be carbon intensive, particularly for materials such as concrete. It is also noted that embodied carbon is heavily influenced by available materials and supply chains in the local and wider area.
- 11.7.5 Construction waste will be managed through the implementation of the SWMP, with a preference of prevention, reuse, recycling and recovery before disposal to landfill. All phases of waste management will result in GHG emissions.

Significance

- 11.7.6 While it is considered that the proposed development meets the applicable adopted policy during construction, it would not contribute to decarbonisation in line with the 2050 net zero trajectory. The emissions generated from construction are partly mitigated through the implementation of the CEMP but only through 'business as usual' measures that are not fully in line with the UK net zero trajectory. Given the carbon intensive nature of the construction period and with consideration of the GHG emission sources noted above and the primary and tertiary mitigation set out in **Section 11.6**, it is considered that the construction of the proposed development will have a **Moderate Adverse**, and therefore **Significant**, effect without further (secondary) mitigation.

Operation

Scope 1

- 11.7.7 During operation of the proposed development, scope 1 emissions will be produced from the use of gas boilers for heating.
- 11.7.8 The proposed development is also anticipated to contribute to an increase in traffic volumes within the Hollingworth Road land parcel and the surrounding network. However, it's important to note that the development has been designed to encourage sustainable transportation. This includes the implementation of walking and cycling routes, EV charging infrastructure, as well as easy access to public transport, all aimed at reducing the reliance on petrol and diesel car use.
- 11.7.9 It is worth noting that the amount of GHGs released from national transport is anticipated to decrease within the next decade as a result of UK Government's Ten Point Plan and the uptake of EVs.

Scope 2

- 11.7.10 Emissions will arise from electricity and energy demand during the operation of the proposed development for powering appliances and maintaining lighting at the Hollingworth Road land parcel. Over the next 10 years, the amount of GHGs released due to electricity demand from the National Grid is expected to decrease. This anticipated reduction is a direct result of rapid decarbonisation efforts.

Scope 3

- 11.7.11 During operation, indirect scope 3 emissions will result from disposal of waste and the provision and treatment of water supplies. The proposed development will provide recycling facilities in line with local policy requirements, enabling users to recycle and reduce the volume of waste sent to landfill, as well as incorporating water efficiency measures. Measures to reduce water demand and increase water efficiency will be provided in line with the water efficiency standard outlined in Building Regulations Part G 2016 of 125 litres/person/day. This reduces the GHG emissions produced from waste management and water use.
- 11.7.12 Emissions resulting from the treatment of both waste and water will be managed by the relevant companies. It is anticipated that emissions will reduce over time as these companies are legally required to align with the Climate Change Act.

Significance

- 11.7.13 It is considered that the Proposed Development is partially consistent with policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for this type of development. Commitment to Building Regulations Part L 2021 and implementing sustainable transport methods is considered to be in line with policy requirements. However, these measures may not be enough to achieve the UK's trajectory towards net zero, without further mitigation measures. Therefore, it is anticipated that there will be a **Moderate Adverse** and therefore **Significant** effect, prior to implementing further mitigation.

11.8 Secondary Mitigation and Enhancement

Construction

- 11.8.1 As the construction phase is managed by the mitigation measures set out in **Section 11.6**, no secondary mitigation measures have been proposed.

Operation

Energy Efficiency

- 11.8.2 The Future Homes Standard (FHS), as an uplift to energy efficiency standards, will be introduced by 2025. This will provide a pathway to highly efficient homes and non-domestic buildings which are 'zero carbon ready'. As construction is expected to be completed in September 2031, it is likely that most of the proposed development will be required to comply with the FHS.
- 11.8.3 It is therefore anticipated that dwellings will be built to a very high level of energy efficiency, therefore reducing the GHG emissions associated with heating and cooling of buildings.

Renewables

- 11.8.4 The **Energy Statement** (Briary Energy, 2024) has identified a number of opportunities for incorporating renewable and low carbon energy generation technologies into the proposed development. The use of renewable technologies, such as PV, are a key form of mitigation because they do not emit GHG emissions. Another suitable technology is likely to be waste water heat recovery (WWHR). The amount of energy to be provided by renewable low carbon technologies will be confirmed at detailed design and secured through condition.

Detailed Construction Environmental Management Plan (CEMP)

- 11.8.5 The construction activities will be managed through the implementation of a detailed CEMP, which is anticipated to be secured by planning condition.

11.9 Residual Effects

Construction

- 11.9.1 The assessment identified a moderate adverse significant effect resulting from GHG emissions during construction, which includes emissions from the combustion of fossil fuels on-site during construction activities and purchased electricity for welfare facilities and lighting. As no secondary mitigation has been identified, it is considered that the effect will remain as **Moderate Adverse** and **Significant**.

Operation

- 11.9.2 The assessment identified a moderate adverse effect resulting from GHG emissions during the operation stage as a result of transport emissions and purchased electricity. Secondary mitigation measures have been identified including the anticipated adoption of the Future Homes Standard in 2025. This will uplift energy performance standards towards the UK net zero trajectory. The mitigation for the proposed development is therefore considered to be in line with local policy and measures necessary to achieve the UK's trajectory towards net zero. There will however be residual emissions and it is therefore considered that the effect will be **Minor Adverse** and **Not Significant**.

11.10 Cumulative Effects

- 11.10.1 IEMA guidance (IEMA, 2022) identifies that all global cumulative GHG sources are relevant to the effect on climate change. This is taken into account in defining the receptor as being of high sensitivity to further emissions. For this reason, the guidance recommends that effects of GHG emissions from specific cumulative projects should not be individually assessed, as there is no basis for selecting particular cumulative projects that have GHG emissions over others. By its nature, the contextualisation of GHG emissions to the national carbon budgets incorporates cumulative contributions of other GHG sources which make up that context. Therefore, a separate cumulative assessment has not been undertaken for the GHG assessment.

11.11 Monitoring

- 11.11.1 As per the EIA Regulations 2017, proportionate monitoring is required for any effects considered to be significant.
- 11.11.2 Construction activities that emit GHGs, including transport, energy consumption and plant emissions will be monitored and managed through the OCEMP.
- 11.11.3 It is not considered proportionate to monitor the operational GHG emissions of the proposed development given that there are several sources of emissions, many of which are out of the control of the applicant. There is also no requirement under EIA regulations to monitor as no significant effect was identified at the operation stage.

11.12 Conclusions

Introduction

- 11.12.1 The Hollingworth Road land parcel encompasses 18.85 hectares of agricultural land, which is predominantly used by grazing animals including horses and cattle. Livestock including horses and cattle contribute both directly and indirectly towards climate change through the production of GHG emissions such as CO₂, methane and nitrous oxide. There is also likely to be machinery in use to support livestock. As a result, there is likely to be a small quantity of direct scope 1 emissions associated with vehicle machinery within the Hollingworth Road land parcel boundary.
- 11.12.2 There are also farm buildings and a residential building within the land parcel boundary associated with Lower Cleggswood Farm. There will be a small quantity of emissions associated with the building use, including scope 1 and scope 2 emissions from heating and lighting.

Construction Effects

- 11.12.3 The main sources of GHG emissions during construction relate to the combustion of fossil fuels during transportation of materials and waste by HGV as well as powering construction engines and equipment. The enabling and land clearance activities required for the construction of the proposed development will result in direct GHG emissions released from movement and disturbance of soil on-site.
- 11.12.4 The proposed development embeds several mitigation measures to reduce GHG emissions during the construction phase that is set out in **Section 11.6**. The mitigation measures identified are in line with local policy requirements but are unlikely to contribute towards the net zero trajectory. There will therefore be a **Moderate Adverse** effect, which is considered significant.

Operation Effects

- 11.12.5 The proposed development is expected to generate increased traffic volumes and therefore increased emissions associated with transport. Emissions will arise from electricity and energy demand during operation of the proposed development for heating, powering appliances and lighting. Indirect emissions will result from disposal of waste and the provision and treatment of water supplies.
- 11.12.6 The proposed development embeds several mitigation measures to reduce GHG emissions during the operation phase as set-out in **Section 11.6**. The mitigation measures identified and implemented are in line with local policy requirements and will contribute towards the net zero trajectory so there will be a **Minor Adverse** effect, which is considered not significant.

11.13 Climate Change Risk Assessment

Introduction

11.13.1 This section presents the assessment of likely significant effects of climate change upon the proposed development. Assessing climate change resilience and adaptation aims to determine the vulnerability of key environmental receptors to climate change, the likely significant effects climate change would have on these receptors and outline the mitigation measures that the proposed development takes to adapt to the projected climate change effects. The Climate Change Risk Assessment (CCRA) is presented in **Table 11.11**.

Policy Context, Legislation and Standards

11.13.2 The overarching planning policy framework applicable to this EIA for the proposed development is outlined in **Volume 1 Chapter 5: Planning and Policy Context**. An overview of the policies of specific relevance to this climate change assessment is provided, below.

11.13.3 The following national legislation has informed the assessment of effects within this section. Further details are provided in **Appendix I.1**:

- **Climate Change Legislation**, including Climate Change Act (2008) (2050 Target Amendment) Order 2019, The Third National Adaptation Programme (NAP3) (2023), The Climate Change Committee's (CCC) Climate Change Risk Assessment 2021 (CCRA3) (2021).
- **National Guidance**, including UK Climate Change Risk Assessment 2022 (Defra, 2022) and the National Adaptation Programme (Defra, 2023).
- **National Planning Policy**, including National Planning Policy Framework (NPPF, 2023), Planning Practice Guidance (PPG, 2021 and Town and County Planning (Environmental Impact Assessment) Regulations (2017) (as amended).

Local Policy

Rochdale Core Strategy

11.13.4 The policies of the Core Strategy (including Policy G1: Tackling and Adapting to Climate Change) which were relevant to the proposed development have been superseded by the Places for Everyone (PfE) document. The key policies of PfE are set out below.

Climate Change Adaptation Supplementary Planning Document (SPD)

11.13.5 The Climate Change Adaptation SPD was published in June 2012. The document outlines actions for development to help climate change adaptation under eight broad headings: location, layout and orientation, materials / structure, environmental performance, green roofs and walls, rainwater harvesting, Sustainable Drainage Systems (SUDs) and green and blue infrastructure.

Places for Everyone (PfE)

11.13.6 The publication version of Places for Everyone (PfE) was published by the Greater Manchester Local Authority (GMCA) in March 2024. Policy JP-S6: Resource Efficiency is relevant to Part 2 of the ES chapter:

- *“The achievement of a circular economy and zero-waste economy will play a key role in meeting Greater Manchester’s ambition of becoming a leading green city region by 2038. The following measures will help achieve this: Using sustainable design and construction*

techniques to reduce carbon emissions, adapt and future proof to the impact of climate change, reduce and recycle waste and minimise water use.”

11.13.7 Policy JP-S1: Sustainable Development and JP-S2: Carbon and Energy are also relevant to the proposed development.

Guidance

11.13.8 Several standards and guidance documents have been used to inform the CCRA methodology. Full details of how the following documents have been considered in this chapter is provided in **Appendix I.1:**

- EIA Guidance on Climate Change Resilience and Adaptation (IEMA, 2020)
- UKCP18 Guidance: How to use the UKCP18 Land Projections (Met Office, 2018)

Consultation

11.13.9 The EIA Scoping Report identified the proposed scope and approach of the Climate Resilience Assessment. The scoping report stated that the assessment will draw on IEMA guidance (2022) to determine significance of effects. The scoping opinion confirmed the need to scope climate change into the Environmental Statement. No further comments were made on the assessment approach within the scoping opinion.

Methodology

Study Area

11.14.1 The CCRA uses the UK Climate Change Projections 2018 (UKCP18) provided by the UK Met Office (Met Office, 2018) for the 25 km grid cell within which the Hollingworth Road land parcel is located (387500, 412500), although the area of influence for potential climate vulnerability impacts is expected to be limited to the Hollingworth Road land parcel and the immediate surrounding area.

Baseline Data Collection

11.14.2 The assessment of construction effects has been undertaken against the current 2022 baseline whereas the assessment of operation effects has been undertaken against a future baseline. Both assessments consider projected future climate scenarios for a number of intervals up to 2099.

11.14.3 The following data sources were reviewed to establish baseline conditions:

- Met Office historic climate data (Met office, N.Da) – to identify the historic trends of relevant climatic factors for the geographic area of the proposed development.
- UKCP18 (Met Office, 2018 – to identify the climate projections for the geographic area and appropriate temporal scope of the proposed development.
- A literature review of relevant publications which are referenced where relevant within Part 2 of this chapter, for variables for which UKCP18 does not provide information (for example, wind direction).

11.14.4 In addition, a review was undertaken of the following chapters within the ES and additional assessments which directly feed into the CCRA:

- Chapter 2: Ecology and Biodiversity
- Chapter 3: Landscape and Visual
- Chapter 4: Hydrology and Drainage
- Chapter 7: Traffic and Transport

UKCP18

11.14.5 The UKCP18 produced by the UK Met Office (Met Office, 2018) is the main source of information on the future baselines (2036, 2050, 2075 and 2099).

11.14.6 UKCP18 uses observations of weather and climate combined with climate models to create a range of climate projections for different emissions scenarios. UKCP18 builds upon previous projections to provide information on how the climate of the UK may change over the rest of this century, describing how climatic conditions, long term seasonal averages and extreme weather conditions may change over future decades. The baseline data is complemented a literature review of relevant publications for variables for which UKCP18 does not provide information (for example, wind direction).

11.14.7 UKCP18 uses Representative Concentration Pathways (RCPs) to develop projections and consider factors such as economic activity, population growth and land use change, which will result in a different range of global mean temperature increases until 2099. RCP8.5 is the most conservative, highest-impact scenario. The scenario reflects an average increase in global mean surface temperature compared to the pre-industrial period of 4.3°C by 2081-2099. IEMA guidance (2020) generally recommends that the high emission scenario, RCP8.5, is used for climate change risk assessments. This is also considered the most appropriate scenario for assessing the impact of climate change on the proposed development based on policy and legislation for the UK to achieve net zero carbon by 2050, which is in line with limiting global temperature increases to 1.5°C, and professional judgement.

11.14.8 IEMA guidance recommends that the climatic baseline should consider extremes in short-term weather events, such as heatwaves; long-term climatic variability, such as seasonal changes in precipitation; and average climate norms, such as ambient temperature.

11.14.9 A review of the following data from this projection has been undertaken:

- Average Summer Precipitation (% change);
- Average Winter Precipitation (% change);
- Average Annual Precipitation (% change);
- Maximum Average Summer Temperature;
- Minimum Average Winter Temperature; and
- Annual Mean Temperature.

11.14.10 The projections (**Appendix I.2**) show the potential change in temperature and precipitation above or below the observed temperature and precipitation for 1981-2000.

Assessment

11.14.11 In accordance with IEMA guidance, the vulnerability and resilience of the proposed development to climate change has been identified by undertaking a risk assessment that includes:

- *“Identifying potential climate change risks to a scheme or project;*
- *Assessing these risks (potentially prioritising to identify the most severe); and*
- *“Formulating mitigation actions to reduce the impact of the identified risks.” (IEMA, 2020)*

11.14.12 The risk assessment considers the likelihood of a hazard occurring that could result in an impact on sensitive receptors. In addition, the magnitude of effects on the proposed development will depend on the severity of the consequence of the impact, and the vulnerability of the receptor itself. The definitions of these terms can therefore be summarised as follows (IEMA 2020):

- **Hazard** is an effect of climate change which has the potential to cause an impact on sensitive receptors associated with the proposed development;
- **Magnitude** is the likelihood of impact occurring and the consequence of the impact of a hazard; and
- **Vulnerability** is the degree to which receptors are susceptible to adverse impacts and is influenced by sensitivity, adaptive capacity, and exposure to climate hazards.

Identification of Receptors

11.14.13 Receptors that may be affected by climate change have been identified with consideration of both extreme weather events and gradual climatic changes in the study area for the proposed development. In accordance with IEMA guidance, the sensitivity of receptors to climate change effects during operation is described in **Table 11.7**. In ascribing the sensitivity of receptors in relation to potential climate change effects, the susceptibility of the receptor (e.g. ability to be affected by a change) and the vulnerability of the receptor (e.g. potential exposure to a change) must be taken into account. These are defined in IEMA (2020) guidance as follows:

“The susceptibility of the receptor can be determined using the following scale:

- High susceptibility = receptor has no ability to withstand/not be substantially altered by the projected changes to the existing/prevaling climatic factors (e.g. lose much of its original function and form).
- Moderate susceptibility = receptor has some limited ability to withstand/not be altered by the projected changes to the existing/prevaling climatic conditions (e.g. retain elements of its original function and form).
- Low susceptibility = receptor has the ability to withstand/not be altered much by the projected changes to the existing/prevaling climatic factors (e.g. retain much of its original function and form).

The vulnerability of a receptor can be defined using the following scale:

- High vulnerability = receptor is directly dependent on existing/prevaling climatic factors and reliant on these specific existing climate conditions continuing in future (e.g. river flows and groundwater level) or only able to tolerate a very limited variation in climate conditions.
- Moderate vulnerability = receptor is dependent on some climatic factors but able to tolerate a range of conditions (e.g. a species which has a wide geographic range across the entire UK but is not found in southern Spain).
- Low vulnerability = climatic factors have little influence on the receptors.”

Table 11.7 Receptor Sensitivity

Receptor	Sensitivity	Reasoning
Operation		
Future users of the Hollingworth Road land parcel (residents, employees, students)	Moderate to High	Some future users of the Hollingworth Road land parcel will be more susceptible to climate change than others, depending on a range of factors such as age (children, young people and the elderly) and existing poor health.
Infrastructure including buildings and roads	Moderate	Infrastructure across the proposed development ranges in value. Critical infrastructure, such as energy and water pipes/cables are of moderate susceptibility given that it can tolerate some changes in climate but is critical for the operation of the proposed development.
Ecology, Landscaping and Planting	Moderate	The habitats that have been identified on-site are included in Chapter 8: Ecology and Biodiversity . The key habitats on the Hollingworth Road land parcel will be neutral grassland (wildflower grassland), which is not considered to be highly sensitive to the effects of climate change. This is because neutral grassland is known to be relatively resilient to environmental changes.

Assessment of Significance

- 11.14.14 There is an absence of significance criteria for determining the significance of effects resulting from climate change. IEMA guidance states that receptor vulnerability and uncertainties must be considered. Significance has therefore been determined by IEMA guidance and professional judgement.
- 11.14.15 Effects that are described as 'minor' or 'negligible' are determined to be 'Not Significant' and effects that are described as 'moderate', 'major' or 'substantial' are determined to be 'Significant'.

Limitations

- 11.14.16 Scientific evidence shows that our climate is changing. However, there are significant uncertainties in the magnitude, frequency and spatial occurrence within the climate projections utilised in this assessment. The UKCP18 are not predictions or forecasts but simulations of potential scenarios of future climate under a range of hypothetical emissions scenarios and assumptions, and therefore cannot be treated as exact or factual, but projection options. The projections are dependent on future global GHG emissions and, while several different scenarios are provided, it cannot be reliably predicted which (if any) emission scenario will occur over the next 80 years (Fung et al., 2018).
- 11.14.17 Additionally, projections after the 2040s increasingly diverge between scenarios and provide greater confidence for long-term climate averages than extreme events. For example, there is greater confidence around changes in temperature than there is in relation to wind. Levels of confidence and certainty are considered when assessing the likelihood and consequence of climate hazards.
- 11.14.18 This ES chapter reports the climate change risk assessment which has used the latest information sources available at the time of submission. New climate information is published regularly as more in-depth analysis of climate changes is completed, which may supersede the information used to inform this assessment.
- 11.14.19 The assessment is largely qualitative, with the exception of assessments relevant to drainage and flood risk, which have been informed by the Environment Agency climate change allowances for increases in peak river flow and rainfall intensity.

11.14.20 There is often uncertainty in the relationship between changes in climate hazards and the respective response in terms of scheme performance. This uncertainty has been assessed qualitatively.

11.14.21 The assessment assumes that mitigation will be effectively implemented.

11.15 Baseline Conditions

Current State of the Environment

UK Observations

11.15.1 Observed climate changes over the UK include:

- The most recent decade (2012–2021) has been on average 0.2°C warmer than the 1991–2020 average and 1.0°C warmer than 1961–1990 (Kendon et al., 2022).
- A new highest daily minimum temperature record was recorded during the July 2022 heatwave of 26.8°C (Met Office, 2022).
- A new highest daily maximum temperature was recorded during the July 2022 heatwave, with a temperature of 40.3°C (Met Office, 2022).
- In the past few decades there has been an increase in annual average rainfall over the UK. However, natural variations are also seen in the longer observational record (Lowe et al., 2019).
- The most recent decade (2012–2021) has been on average 2% wetter than 1991–2020 and 10% wetter than 1961–1990 for the UK overall (Kendon et al., 2022).
- There have been fewer occurrences of max gust speeds exceeding 40/50/60 Kt for the latest two decades compared to 1980s and 1990s. The UK annual mean wind speed from 1969 to 2021 shows a downtrend, consistent with global observations (Kendon et al. 2022).
- Widespread and substantial snow events have occurred in 2021, 2018, 2013, 2010 and 2009, but their number and severity have generally declined since the 1960s (Pirret et al., 2021).

Regional Observations

11.15.2 Historic climate averages during the period 1991–2020 for the closest climate station to the Hollingworth Road land parcel (Rochdale), obtained from the Met Office website (Met office, N.Dc), indicates the following:

- Average annual maximum temperature was 13.1°C;
- Warmest month on average was July (mean maximum temperatures of 20.0°C);
- Coldest month on average was February (mean minimum temperature of 1.4°C);
- Average total annual rainfall was 1197.2 mm;
- Wettest month on average was December (average monthly rainfall of 138.9 mm); and
- Driest month on average was May (average monthly rainfall of 65.7 mm).

Local Observations

- 11.15.3 The Hollingworth Road land parcel lies within an area issued with a red warning for extreme heat between the 16th and 19th July 2022. The unprecedented heatwave marked a milestone in UK climate history as the first year that 40°C was recorded within the UK.
- 11.15.4 The River Roch and Littleborough Flood Risk Management Scheme (FRMS) was established to address the high level of flood risk in Rochdale and Littleborough. These towns have a long history of flooding, with significant events recorded in 1991, 1995, 2008, and 2015. The most severe recent event occurred on 26th and 27th December 2015 during Storm Eva, when 324 properties were flooded. This flood exceeded the previous highest recorded levels along the River Roch, causing widespread damage and disruption – however, these flooding events occurred in the surrounding area, and not within the Hollingworth Road land parcel. The FRMS seeks to mitigate these risks and protect the towns from future flooding events.
- 11.15.5 Hydrology and Drainage (**Chapter 4**) sets out the existing conditions with regards to flood risk. The Hollingworth Road land parcel is designated as Flood Zone 1, meaning that it is at low risk of fluvial or tidal flooding.

Baseline Evolution

- 11.15.6 This section presents the future climate simulations extracted from UKCP18 up to 2099. **Figures 1.2.1 to 1.2.6 in Appendix I.2** show the grid square projections for average summer, winter and annual precipitation, maximum average summer temperature, minimum average winter temperature and annual mean temperature. A summary of the projections is provided. This is supported by data extracted from the probabilistic projections, a summary of which is provided in **Table 11.8** below.

Table 11.8 50th Percentile Climate Projections at 25 km grid square (387500, 412500) using 1981-2000 scenario RCP 8.5

Date	Climate Variable at 50th Percentile					
	Mean air temperature anomaly* at 1.5 m (°C)	Annual Precipitation rate anomaly (%)	Maximum Summer air temperature anomaly at 1.5 m (°C)	Average Summer Precipitation rate anomaly (%)	Minimum Winter air temperature anomaly at 1.5 m (°C)	Average Winter Precipitation rate anomaly (%)
2023	0.77	0.50	0.93	7.46	0.71	2.60
2036	1.11	0.10	1.34	-9.57	1.06	2.43
2050	1.60	0.02	2.05	-16.12	1.56	5.58
2075	2.85	0.58	3.91	-29.09	2.58	12.61
2099	4.53	2.36	6.58	-45.91	4.02	21.14

*Anomaly refers to the change compared to the baseline. The projections are not absolute values.

- 11.15.7 The projections show an almost continuous increase in annual average temperature over the next 80 years (**Figure 1.2.1 in Appendix I.2**). Annual precipitation is shown to vary year on year, with some years being dryer or wetter than previous years (**Figure 1.2.2 in Appendix I.2**).
- 11.15.8 The projections suggest that summers will become warmer and drier, with an expected increase in maximum summer temperatures and overall decline in summer precipitation (**Figures 1.2.3 and 1.2.4 in Appendix I.2**). Natural variations may mean that some cooler and/or wet summers will occur.

- 11.15.9 Winters may become milder and wetter, with an overall increase in both minimum winter temperature and winter precipitation. Natural variations may mean that some cold and/or dry winters may still occur (**Figure 1.2.5** and **1.2.6** in **Appendix I.2**).
- 11.15.10 In the UK, the heaviest snowfalls tend to occur when the air temperature is between zero and 2°C (Met Office, N.Dd). There is less certainty in the magnitude of change to snow occurrence and amount, although climate models do show a downward trend in both falling and lying snow over time.

Extreme Weather Events

Heatwaves

- 11.15.11 A heatwave is an extended period of hot weather relative to the expected conditions of the area at that time of year, which may be accompanied by high humidity. For the UK, the Met Office defines a heatwave as “*when a location records a period of at least three consecutive days with daily maximum temperatures meeting or exceeding the heatwave temperature threshold*” (Met Office, N.De). The threshold varies by county and have been calculated using the 1981-2010 climatology of daily maximum temperature at the mid-point of the meteorological summer (15 July), which for the Hollingworth Road land parcel is 27°C. As outlined in **Table 11.8**, temperatures are projected to increase by 6.6°C by 2099.
- 11.15.12 Research has found that the likelihood of heatwave events in the UK is about 10 times higher due to climate change (Vautard R. *et al.*, 2019). As discussed above, the maximum summer air temperature and annual average air temperature is expected to increase over the next 80 years, which could result in more intense and more frequent heatwaves.

Extreme Cold Snaps

- 11.15.13 It is projected that winters may become increasingly milder, with minimum temperatures set to rise by over 4°C by 2099. Natural variations may mean that some cold and/or dry winters may still occur.

Heavier Rainfall

- 11.15.14 Heavy rainfall that may lead to flooding is hard to predict in the long term. A study has shown that an extended period of extreme winter rainfall in the UK is now about seven times more likely due to human-induced climate change (Christidis and Stott, 2015), although the largest changes in heavy rainfall since 1961 have occurred in Scotland and northern England.
- 11.15.15 The climate projections for the Hollingworth Road land parcel show there will be an increase in average winter precipitation (**Figure 1.2.6** in **Appendix I.2**). There is also a pattern of larger increases in winter precipitation over southern and central England toward 2099.
- 11.15.16 While projections indicate a trend that summers will become dryer toward the end of the century, there is also evidence that summer rainfall events may become more intense when they do occur.

Low Rainfall and Drought

- 11.15.17 Droughts are natural events which occur when a period of low rainfall creates a shortage of water. The UKCP18 projections show a trend toward drier summers on average, although the uncertainties of these are wide ranging. Research on the influence of climate change on drought in the UK is limited and given the several different factors that influence droughts (meteorological, hydrological, and societal), it is challenging to identify whether drought events will become more common and prolonged in the future.

High Winds

- 11.15.18 On average throughout the year, near-surface wind speeds are projected to decrease. However, during the winter season, where more significant impacts of winds are experienced (Met Office, 2019), near-surface winds speeds are projected to rise towards the second half of the 21st Century. However, these projections are modest compared to natural variability from month to month and season to season. Projections of future wind and storm occurrence and intensity are uncertain and confidence in projections is low. Research has shown that there are no compelling trends in maximum gust speeds over the last four decades (Kendon *et al.*, 2019) and therefore there is no evidence that link climate change and storms.
- 11.15.19 Due to the little evidence that storms may increase in frequency or severity as a result of climate change, likely significant effects resulting from storms and high winds are scoped out of further assessment.

Summary of Projected Climatic Changes

- 11.15.20 In summary, it is anticipated that the Proposed Development will experience the following climatic changes:
- An increase in average annual temperature
 - An increase in maximum temperature, particularly in the summer
 - More extreme rainfall events
 - An increase in winter rainfall
 - A reduction in summer rainfall

11.16 Primary and Tertiary Mitigation

- 11.16.1 The proposed development has been designed to incorporate mitigation and adaptation measures to address climate change. This section provides a summary of these measures below, many of which have been addressed in full in other chapters within this ES:

Primary Mitigation

Operation

Flood Risk

- 11.16.2 Climate change is likely to increase pressure on water sources and the frequency and severity of flooding. The proposed development incorporates blue infrastructure including a Sustainable Drainage System (SuDS) to reduce flood risk on the Hollingworth Road land parcel, with future climate changes.
- 11.16.3 SuDS also helps to control the quality and quantity of surface water runoff conveyed to the local watercourses. Four attenuation ponds and swales have been proposed which provides a surface water management solution. Ponds can help support the management of storm water during extreme rainfall events and can store rainwater for irrigation purposes. This provides additional water security, which is particularly important during periods of drought.

Ecology and Planting

- 11.16.4 Planting design has been completed by Bloor Homes (2024) and considers the need for the Proposed Development to be resilient to future impacts of climate change. Species selected are

to be tolerant of varying conditions, including extreme dry conditions (drought) and extreme wet conditions (flooding). Planting will be implemented as demonstrated on the Parameter Plans (**Volume 1: Appendix C**). This approach provides resilience in several ways, including reducing the urban heat island effect, sequestering carbon dioxide to reduced GHGs, and improving air quality.

Tertiary Mitigation

Operation

Overheating

- 11.16.5 Part O (Overheating) of the Building Regulations came into effect in June 2022. The Proposed Development will need to align to Part O 2021 for construction of dwellings after June 2023. Part O 2021 sets new standards for overheating in new residential dwellings for internal thermal comfort, with the likely increases in temperature in the future in the UK.

Water Efficiency

- 11.16.6 The Proposed Development will continue to be designed with due regard to the water management hierarchy, whereby measures are first implemented to reduce water use, before considering options for re-use or recycling of water. The proposed development will target the water efficiency standard outlined in Building Regulations Part G, which is 125 litres/person/day. This target is applicable to residential dwellings only.

Infrastructure

- 11.16.7 Infrastructure such as ground cables and pipes may be affected by changes in climatic norms. Therefore more maintenance and repair may be required at the Hollingworth Road land parcel in the future. This will be secured by a planning condition where risk assessments will be undertaken to manage risks from future climate change in accordance with nationally accepted standards and guidance.

Landscape and Biodiversity Management Strategy

- 11.16.8 A Landscape and Biodiversity Management Strategy (Stantec, 2024) has been produced in support of the planning application. The LBMS supports the growth and long-term management of the planting which helps provide greater resilience to the Proposed Development.

11.17 Assessment of Likely Effects

- 11.17.1 The projected climatic changes may have a direct impact on the Proposed Development or result in secondary impacts which may impact the performance or integrity of the proposed development.

Operational Effects

- 11.17.2 **Table 11.9** outlines the potential significant effects from climate on the identified receptors within the Proposed Development.

Table 11.9 Climate Change Risk Assessment

Climate Condition / Hazard	Receptor	Receptor Vulnerability	Potential Impact (with primary and tertiary mitigation)	Significance
Long Term Changes to Climate Norms	Future Users of the Hollingworth Road land parcel	Moderate to High	Increased temperatures and drier summers may affect human behaviour with, for example, an increase in outdoor activity. The proposed development includes a network of open spaces which also encourages outdoor activity. The warmer winters and reduced risk of cold snaps may have potentially positive outcomes for those with circulatory and respiratory impacts.	Negligible
	Infrastructure	Moderate	Infrastructure may require more maintenance and repair as changes to climatic norms may cause increased stress on, for example, below ground cables and pipes. This will be managed at the detailed design stage, where risk assessments will be undertaken to manage risks from future climate change in accordance with nationally accepted standards and guidance.	Negligible
	Ecology, Landscaping and Planting	Moderate	Warmer, drier summers and milder wetter winters are likely to have a long-term impact on species' ranges, potentially causing flora and fauna to relocate to more tolerable climate conditions. The changes in annual and seasonal averages may also impact the timing of seasonal biological activities, such as migrating birds.	Minor
Heatwaves	Future Users of the Hollingworth Road land parcel	Moderate to High	Increased frequency and intensity of heatwaves may adversely impact human health by increasing the risk of mortality and morbidity due to heat (NHS, 2012). Primary mitigation in the design of the proposed development, for example the provision of open space will help to provide evaporative cooling at night. This will help to reduce the risk of building overheating and maintain thermal comfort during periods of extreme heat should promote healthy lifestyles for members of the community and provide evaporative cooling at night. The proposed development will also need to align with Part O (Overheating) of the Building Regulations, which sets new standards for overheating in new residential dwellings for internal thermal comfort.	Minor
	Infrastructure	Moderate	Extremes in temperatures have the potential to damage infrastructure, for example causing tarmac to soften, melt and be more susceptible to damage. As a result, additional maintenance and emergency repairs may be required. This will be managed at the detailed design stage, where risk assessments will be undertaken to manage risks from future climate change in accordance with nationally accepted standards and guidance.	Negligible
	Ecology, Landscaping and Planting	Moderate	Increased frequency of extreme weather events such as heatwaves could change the type and structure of vegetation without the implementation of further mitigation. The planting design will consider climate change, and species will be selected that are tolerant of varying conditions including extreme heat.	Minor

Climate Condition / Hazard	Receptor	Receptor Vulnerability	Potential Impact (with primary and tertiary mitigation)	Significance
Low Rainfall and Drought	Future Users of the Hollingworth Road land parcel	Moderate to High	Periods of low rainfall and drought have the potential to adversely affect public water supply. Measures to reduce water demand and increase water efficiency will be provided in line with the water efficiency standard outlined in Building Regulations Part G 2016 which is 125 litres/person/day. Water companies also have a statutory duty to maintain a secure water supply during a drought and to produce Water Resources Management Plans (WRMP), which consider climate change and drought.	Negligible
	Infrastructure	Moderate	Reduction in rainfall could cause soil moisture deficits, which may affect soil stability. This may increase risk of damage to infrastructure without the implementation of further mitigation.	Minor
	Ecology, Landscaping and Planting	Moderate	Increased frequency of low rainfall and droughts combined with higher average temperatures may adversely impact the productivity, function and structure of ecosystem services by, for example, causing an increase in erosion as soils and substrates dry out.	Moderate
Heavy Rainfall and Flooding	Future Users of the Hollingworth Road land parcel	Moderate to High	Flooding has the potential to isolate future users of the Hollingworth Road land parcel, disrupt service provision, damage homes and increase risk to human health, in particular mental health. Hydrology and Drainage (Chapter 8) assesses the likely significant effects of flood risk and states that proposed development is located in Flood Zone 1. With the implementation of the proposed drainage strategy, the residual effect is considered to be Negligible.	Negligible
	Infrastructure	Moderate	Increased precipitation during the winter and more intense rainfall events are likely to increase flood risk and surface water run-off. This could prevent the use of or damage infrastructure and also adversely affect water quality. Hydrology and Drainage (Chapter 8) assesses the likely significant effects of flood risk. The proposed development is located in Flood Zone 1 and the proposed drainage strategy will be implemented, thereby the likely effect is Negligible.	Negligible
	Ecology, Landscaping and Planting	Moderate	Flooding has the potential to damage planting and habitats on-site. The proposed drainage strategy will be designed to accommodate all surface water flows and mimic as closely as practical the natural flow routes of the existing Site. Planting species on the Hollingworth Road land parcel will be selected that are tolerant of extreme conditions including extreme rainfall.	Negligible

11.18 Secondary Mitigation and Enhancement

Operation

Overheating

- 11.18.1 An overheating study, following CIBSE TM59, will be carried out for the proposed development. This will be secured via a planning condition and will identify further mitigation measures which will reduce adverse effects of overheating on future users of the Hollingworth Road land parcel.

Surface Water Management

- 11.18.2 Management of surface water infrastructure will be carried out to make sure that a build-up of sediment in attenuation features does not increase the risk of flooding to the Hollingworth Road land parcel. The details will be set out in an appropriate management plan which will be prepared as part of detailed design works.

11.19 Residual Effects

- 11.19.1 The minor adverse effect on human health as a result of the increased likelihood and frequency of heatwaves would be further mitigated by the implementation of overheating assessments secured by planning condition and designing to Part O standards. However the likely effect will remain as **Minor Adverse** and **Not Significant**. Mitigating these effects beyond the further mitigation proposed is reliant on aspects outside of the scope of the proposed development, such as increasing the resilience of health services and availability of emergency services.
- 11.19.2 Potential moderate adverse effects to the natural environment were identified resulting from heatwaves and droughts. This is reduced to **Minor Adverse** and **Not Significant**. Minor Adverse effects were also identified on the natural environment as a result of long-term changes in climate norms which is reduced to **Negligible** as a result of further mitigation measures.

11.20 Cumulative Effects

- 11.20.1 Please refer to Volume 1: Chapter 10 for the cumulative effects assessment.

11.21 Monitoring

- 11.21.1 No significant residual effects have been identified in relation to climate vulnerability and resilience, therefore no monitoring is proposed.

11.22 Conclusions

Introduction

- 11.22.1 UKCP18 climate projections were used to establish evolving baseline climate conditions up to 2099. It is expected that the Proposed Development may experience warmer, drier summers, and milder, wetter winters, along with an increase in frequency and intensity of extreme weather events such as droughts or heatwaves. This has the potential to adversely affect receptors within the proposed development, including future users of the Hollingworth Road land parcel, buildings and infrastructure, and ecology.

Operation Effects

- 11.22.2 The climate resilience assessment identified key environmental receptors to climate change and determined their sensitivity to the projected climate change impacts. During the operational phase, infrastructure such as buildings and roads, and ecology, landscaping and planting were determined to be moderately vulnerable, while construction workers and future users of the Hollingworth Road land parcel including residents, employees and students, were determined to be moderately to highly vulnerable to climate change.
- 11.22.3 Primary mitigation includes incorporation of a Sustainable Drainage System to reduce flood risk, alignment to Part O 2021 of the Building Regulations and designing with regard to the water management hierarchy.
- 11.22.4 The effects of climate change on the Proposed Development are determined to be **Not Significant (Minor-Negligible)**, with the exception of low rainfall / drought on the natural environment and heatwaves on both future users of the Hollingworth Road land parcel and the natural environment. These were determined to experience a **Minor Adverse** effect without the implementation of further mitigation.

11.23 References

- CCC (2021) 'Independent Assessment of UK Climate Risk' Climate Change Committee [online]: <https://www.theccc.org.uk/publication/independent-assessment-of-uk-climate-risk/> Accessed: 17/10/2023
- Christidis, N., and P. A. Stott. (2015) "Extreme rainfall in the United Kingdom during winter 2013/2014: The role of atmospheric circulation and climate change [in "Explaining Extremes of 2014 from a Climate Perspective"]." Bull. Amer. Meteor. Soc., 96 (12), S46-S50, doi: 10.1175/BAMS-D-15-00094.1.
- Institute of Environmental Management & Assessment (IEMA) (2020) 'Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation' [online]: [IEMA-EIA-Climate-Change-Resilience-June-2020-1.pdf](#) Accessed: 17/10/2023
- Institute of Environmental Management & Assessment (IEMA) (2022) 'Assessing Greenhouse Gas Emissions and Evaluating their Significance' [online]: [J35958_IEMA_Greenhouse_Gas_Guidance-1.pdf](#) Accessed: 11/10/2023
- DBEIS 2020, 'Updated energy and emissions projections: 2019' Department for Business, Energy & Industrial Strategy, National Statistics [online]: [Updated energy and emissions projections: 2019 - GOV.UK \(www.gov.uk\)](#) Accessed: 17/10/2023
- DBEIS 2023, 'UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2021', Department for Business, Energy & Industrial Strategy, National Statistics [online]: [UK local authority and regional greenhouse gas emissions national statistics - GOV.UK \(www.gov.uk\)](#) Accessed: 17/10/2023
- DBEIS (2021) 2019 UK Greenhouse Gas Emissions, Final figures, Department for Business, energy & Industrial Strategy, National Statistics [Online] Available at: [2020 UK greenhouse gas emissions, provisional figures \(publishing.service.gov.uk\)](#) Accessed: 01/11/2023
- DfT (2018) Reducing emissions from road transport: Road to Zero Strategy, Department for Transport, Office for Low Emission Vehicles, [online] available here: <https://www.gov.uk/government/publications/reducing-emissions-from-road-transport-road-to-zero-strategy> Accessed: 17/10/2023
- DfT 2020 'Government takes historic step towards net-zero with end of sale of new petrol and diesel cars by 2030', Department for Transport, Office for Low Emission Vehicles, Department for Business, Energy & Industrial Strategy, The Rt Hon Alok Sharma MP, and The Rt Hon Grant Shapps MP [online]: <https://www.gov.uk/government/news/government-takes-historic-step-towards-net-zero-with-end-of-sale-of-new-petrol-and-diesel-cars-by-2030> Accessed: 17/10/2023
- Fung F, Lowe J, Mitchell JFB, Murphy J, Bernie D, Gohar L, Harris G, Howard T, Kendon E, Maisey P, Palmer M and Sexton D (2018). "UKCP18 Guidance: Caveats and Limitations." Met Office Hadley Centre, Exeter.
- Kendon M., (2014) "Has there been a recent increase in UK weather records?" Weather. RMetS. Volume 69 Issue 12: 327-332 <https://doi.org/10.1002/wea.2439>
- Kendon, M. *et al.* (2022) 'State of the UK Climate 2021', *International Journal of Climatology*, 42(S1).
- Lowe, J.A., Bernie, D., Bett, P., Bricheno, L., Brown, S., Calvert, D., Clark, R., Eagle, K., Edwards, T., Fosser, G., Fung, F., Gohar, L., Good, P., Gregory, J., Harris, G., Howard, T., Kaye, N., Kendon, E., Krijnen, J., Maisey, P., McDonald, R., McInnes, R.,

McSweeney, C., Mitchell, J.F.B., Murphy, J., Palmer, M., Roberts, C., Rostron, J., Sexton, D., Thornton, H., Tinker, J., Tucker, S., Yamazaki, K. and Belcher, S. (2019) "UKCP18 Science Overview Report" Met Office Hadley Centre, Exeter.

- Met Office (2018) "UKCP18 Guidance: How to use the UKCP18 land projections" Available here:
<https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-guidance---how-to-use-the-land-projections.pdf> Accessed: 17/02/2023
- Met Office (2019) "UKCP18 Factsheet: Wind" [online] available here:
<https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-wind.pdf> Accessed 17/10/2023
- Met Office (2022) *New record from July heat, Met Office*. Available at:
<https://www.metoffice.gov.uk/about-us/press-office/news/weather-and-climate/2022/new-record-from-july-heat> (Accessed: 24 July 2023).
- Met Office (N.Da) "About UKCP18" [online] available here:
<https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/about> Accessed: 17/02/2023
- Met Office (N.Db) "UKCP18 Factsheet: Snow" [online] available here:
<https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-factsheet-snow.pdf> Accessed: 17/10/2023
- Met Office (N.Dc) "UK Climate Averages" [Rochdale - Climate Station \(Greater Manchester\) UK climate averages - Met Office](#) Accessed: 17/10/2023
- Met Office (N.Dd) "How does snow form?" [online] available here:
<https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/snow/how-does-snow-form> Accessed: 16/10/2023
- Met Office (N.De) "What is a Heatwave?" [online] available here:
<https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/temperature/heatwave> Accessed: 14/10/2023
- Metulla C., Schroner W., Alexandersson H., Von Storch, H., Wang X. L. (2008) "European storminess: Late nineteenth century to present" *Climate Dynamics* 31(2):125-300
- NAEI, 2019. 'Basic Fleet Projections – Proportion of VKM by Vehicle Type, Road Type and DA regions'. National Atmospheric Emissions Inventory. [online] Available
<https://naei.beis.gov.uk/data/ef-transport> Accessed: 05/10/2023
- Pirret, J. *et al.* (2021) *UKCP18 Factsheet: Snow*. Exeter: Met Office Hadley Centre.
- Publicly Available Standard (PAS, 2080) 2023, Carbon management in Infrastructure (British Standards Institute (BSI)).
- Seijan, V. *et al.* (2016) "Livestock as Sources of Greenhouse Gases and its Significance to Climate Change," in *Greenhouse Gases*. Croatia: IntechOpen.

