WEST OF LOUGHBOROUGH

ENVIRONMENTAL STATEMENT

Volume 2

August 2014

WILLIAM DAVIS

PERSIMMON
Together, we make a home

LAND AT WEST OF LOUGHBOROUGH SUSTAINABLE URBAN EXTENSION

OUTLINE APPLICATION FOR RESIDENTIAL AND ASSOCIATED DEVELOPMENT

ENVIRONMENTAL STATEMENT – VOLUME 2

September 2014

Our Ref: JBB7747.C2084

RPS Planning & Development Ltd
Highfield House
5 Ridgeway
Quinton Business Park
Birmingham
B32 1AF

Tel: 0121 213 5500
Fax: 0121 213 5502
Email: rpsbm@rpsgrpoup.com

QUALITY MANAGEMENT

Prepared by:	**Tim Watton/ Eleanor Suttie/ Cameron Austin-Fell**
Authorised by:	**Mark Sackett**
Date:	**September 2014**
Project Number/Document Reference:	**JBB7747/C2084**

CONTENTS

TABLES

FIGURES

6.12 Night-time Photographs

6.13 Charnwood Landscape Capacity and Sensitivity Appraisal

7.1 Map of Archaeological Features

10.1 Consultation Results Plan

10.2 Phase One Habitat Plans

10.3 Designated and Potential LWS Habitat Plan

10.4 Badger Data Records Plan (Confidential Plan bound separately)

10.5 Badger Survey Results Plan (Confidential Plan bound separately)

10.6 Badger Survey Bait Marking Results Plan (Confidential Plan bound separately)

10.7 Culvert Details Plan (Confidential Plan bound separately)

10.8 Badger Mitigation Plan (Confidential Plan bound separately)

10.9 Site Location and Consultation Results Plan

10.10 Bat Activity Transects

10.11 Building Reference Plan

10.12 Principal Habitat / Corridor Plan

10.13 Bat Roosting Potential in Trees Plan

10.14 Static Bat Detector Location Plan

10.15 Botanical Survey Locations

10.16 Breeding Bird Surveys Notable Species Locations Plans

10.17 Winter Bird Surveys Distribution of Notable Species Plan

10.18 Pond Locations Plan

10.19 Waterbody Locations Plan

10.20 Otter Activity Plans

10.21 Reptile Refugia and Results Plan

10.22 Tree Survey Site Location Plan

10.23 Tree Survey Plans

10.24 Tree Retention Plans

11.1 Air Quality Assessment Area

11.2 East Midlands Airport Meteorological Station Wind Rose

12.1 Noise Monitoring Locations

12.2 Traffic Receptor Locations

APPENDICES

10.8 Great Crested Newt Report

10.9 Riparian Species Survey Report

10.10 Reptile Survey Report

10.11 Arboricultural Assessment

11.1 Air Quality Assessment

12.1 Noise Assessment

13.1 Flood Risk Assessment

14.1 Soil Resources and Agricultural Land Use and Quality Report

14.2 Minerals Desk Study

1 INTRODUCTION

1.0.1 This Environmental Statement (ES) has been prepared to accompany an outline planning application for a mixed use Sustainable Urban Extension (SUE) to the West of Loughborough Town ("the Development") as indicated by Figure 1.1. An ES is required under the provisions of Schedule 2 development listed by the Environmental Impact Assessment Regulations (2011) due to the scale and nature of the Development.

1.0.2 The proposal has been prepared in the context of the emerging Charnwood Borough Local Plan Core Strategy which was submitted for examination in December 2013, alongside the saved policies in the Adopted Local Plan (2004). In addition, the Government published the National Planning Policy Framework (NPPF) in 2012 clarifying that all development proposals that can be demonstrated to be sustainable development should be considered favourably in the first instance with a presumption of approval from Local Planning Authorities. The Government has also published in 2014 its national Planning Practice Guidance (PPG) to provide further guidance on implementing the NPPF.

1.0.3 This ES has been prepared on behalf of Persimmon Homes (North Midlands) and William Davis Ltd ("the Consortium") who collectively with Charnwood Borough Council ("CBC") have a controlling interest in the land identified in Figure 1.1 ("the Site").

1.1 Site Location

1.1.1 The Site is principally open field and arable grassland located West of Loughborough Town and to the east of the M1 Motorway. It forms a SUE to the west of the settlement of Loughborough which is the principal residential and employment location in the area.

1.1.2 Other settlements that are located nearby include Shepshed to the west and the village of Hathern to the north. Shepshed is a main settlement within Charnwood Borough and offers residential and employment opportunities to the locality. The Site is physically separated from Shepshed by the M1 motorway. It is intended that the proposals will maintain the element of separation from Shepshed through sensitive landscaping and woodland buffer areas.

1.1.3 The village of Hathern to the north of the Site is substantially smaller than Shepshed and is a rural settlement. Its visual separation from the proposals will also be maintained through the inclusion of landscaping and woodland screening within the proposals.

1.1.4 To the south of the Site, beyond the A512(T), the area is open fields linking up with the Longcliffe Golf Club. The area immediately to the south of the A512(T) is also identified as an area for development in the emerging Charnwood Core Strategy for the expansion of the Loughborough University Science and Enterprise Park. This links into the south western edge of Loughborough.

1.2 Site Description and Context

1.2.1 The Planning Application Site ("the Site") extends to a total of 466ha and is the land within the red line boundary as illustrated on the Site Plan (Figure 1.1).

1.2.2 The Site is a single parcel of land to the west of Loughborough and is being promoted as part of a comprehensive wider Masterplan constituting a SUE for the west of Loughborough. The land is

typically undulating and in agricultural use or associated with Garendon Park. The Site also includes 17 designated heritage assets including Garendon Park which is grade II registered, Scheduled Ancient Monuments and 15 Listed Buildings. The proposal includes the restoration of Garendon Park.

1.2.3 The Black Brook Corridor runs through the northern part of the Site and contains areas of flood plain. There are other smaller areas of flooding associated with watercourses within the Site, particularly the Oxley Gutter and Shortcliff Brook.

Site Boundaries

1.2.4 The Site is located to the west of Loughborough and its boundaries comprise a number of different treatments and categories of land use as detailed below.

1.2.5 Eastern Boundary – The eastern boundary runs predominately along the urban edge of Loughborough Town. The boundary is primarily formed by the rear of existing residential properties. Other features and land uses that form part of the eastern boundary comprise the playing fields of Thorpe Acre School and College and existing open space and playing fields to the north east. Also of significance is the area of Booth Wood adjoining the eastern boundary.

1.2.6 Northern Boundary – The northern boundary is principally formed by the highway network of the A6(T) and Hathern Road. Elsewhere the boundary is set back from Hathern Village and is formed by the existing field patterns.

1.2.7 Western Boundary – The western boundary is principally formed by the M1 Motorway that runs north to south along the boundary and forms a hard permanent boundary between the Site and the settlement of Shepshed, located to the west of the motorway. Junction 23 of the M1 is located adjacent the southwestern most section of the Site.

1.2.8 Southern Boundary – The southern boundary is formed by the A512(T) New Ashby Road that links Loughborough and Junction 23 of the M1.

1.3 Social-Economic Factors

1.3.1 The social and economic assessment has assessed the effects of the Development across Loughborough and the Borough of Charnwood, using East Midlands region and England data for comparisons. Baseline conditions have been appraised relating to population demographic evidence, employment statistics and projections, social infrastructure provision and housing market conditions.

1.3.2 The assessment considered the environmental operational effects of up to 3,200 additional dwellings and 16ha of employment land in Charnwood Borough, as well as interim effects experienced during the construction of the Development.

1.3.3 It is anticipated that the Development will provide accommodation for 7,800 people and 1,360 jobs as part of the proposals, with over 7,600 jobs associated with the construction industry. The ES appraises the social and economic effects of this population and job increase, including the likely infrastructure requirements.

1.3.4 A detailed assessment is provided in Chapter 5 – Socio Economic Factors, of this ES.

1.4 Landscape and Visual Amenity

1.4.1 The landscape context of the Site is varied in character and includes residential settlements, historic parkland, agricultural land, main roads and other urban influences. Loughborough lies to the east of the Site, whilst Hathern and Shepshed are situated further north and west respectively.

1.4.2 Landform across the local landscape is varied. Low lying, gently undulating land is situated within central areas of the Site, between Loughborough and Shepshed, ranging between 50-65m AOD. Localised shallow valleys are associated with minor watercourses including Black Brook and Shortcliff Brook.

1.4.3 Topography within the wider landscape is more varied where hills and ridgelines occur. To the south, Shepherd's Hill, Home Covert and Bunker Hill occur as land rises towards Nanpantan. To the north, Hathern Hill and Bellevue Hill form a ridgeline which defines the local landscape.

1.4.4 A detailed assessment is provided in Chapter 6 – Landscape and Visual Amenity, of this ES.

1.5 Archaeology and Cultural Heritage

1.5.1 An archaeological desk based assessment of the Site was conducted in September 2013 and assessed the significance of known archaeological heritage assets within and around the Site, and the potential for the presence of as yet unknown buried archaeological remains within the Site. A Draft Conservation Management Plan (CMP) was also produced in November 2013. The CMP compiled information on the historic environment from various sources including the Site itself, English Heritage databases and from information held by the Leicestershire and Rutland Historic Environment Record Office. The CMP has assessed the significance of the structures within the Registered Park and those associated with the Registered Park (such as Stone Bow Bridge) that fall outside of the boundary.

1.5.2 The assessments have identified that there are 17 designated heritage assets within the Site, predominantly within Garendon Park. These designated heritage assets include: the Scheduled Ancient Monument of Garendon Abbey; Garendon Park; and 15 Listed Buildings. The assessment of heritage assets is covered in Sections 7 and 8 of this ES.

1.5.3 The Leicestershire and Rutland Historic Environment Record lists 31 archaeological sites within the Site itself, and a further 62 sites within a 500m search area surrounding the Site. The assessment has established that the Site has a high potential to contain archaeological remains of Prehistoric and Roman date. A reasonably uniform potential for low density flint scatters of earlier Prehistoric date and settlement and field systems of Iron Age and Roman date exists across the Site. Such remains are likely to be of local significance. There is potential for a high status Roman building or villa to exist on the northern side of the Black Brook. Depending upon state of preservation etc. this feature is likely to be of regional significance, however geophysical survey revealed that this feature is predominantly outside of the Site boundary. The potential for significant remains dating to the Saxon, Medieval and later periods is confined to areas of Garendon Park that will not be impacted by the Development.

1.5.4 A detailed assessment is provided in Chapter 7 – Archaeology and Chapter 8 – Cultural Heritage, of this ES.

1.6 Accessibility and Movement

1.6.1 The Site benefits from good access to public transport with a number of bus stops close to the Site, with bus stops along the A6(T) at Hathern approximately 1.5km to the north, along the A512(T) approximately 2.3km to the south and along Kenilworth Avenue approximately 1.4km to the east. Access to Loughborough Railway Station is also good with the station approximately 5.5km from the Site.

1.6.2 The Site has good access to Loughborough Town Centre which provides services and facilities approximately 4.5km away. Loughborough offers the central administrative services of the Borough and is an established University Town. Shepshed is also located close to the Site at approximately 3.3km distance and offers local services and facilities. There is also a retail unit and District Centre 2.3km away on Maxwell Drive to the east of the Site.

1.6.3 There are a number of existing public rights of way through the Site and these will be retained, in addition to the provision of new public pedestrian, cycle and equestrian routes.

1.6.4 In terms of medical practices, Dishley Grange Medical Practice and Gorse Covert Dental Practice are approximately 2.3km to the east of the Site on Maxwell Drive. There is also Forest Edge Medical Centre on Old Ashby Road approximately 3.3km to the south, and Cross Street Surgery within Hathern approximately 2.6km to the north. In consultation with the local NHS, the Consortium has been advised that contributions will be sought towards extending capacity in adjacent GP surgeries, rather than there being a requirement for a new surgery within the Development. If this advice were to change, land can be made available within the Community Hub area to accommodate a new surgery. The Community Hub is up to 4a in size and comprises a local convenience retail unit, A2 financial and professional services, A3 food and drink, B1 businesses and D1 uses.

1.6.5 In terms of educational facilities, existing secondary school places are available to serve the full Development at locations adjoining the Site at Shepshed and in West Loughborough. Primary school provision will be made on site in accessible locations.

1.6.6 On the basis of the above, suitable and accessible services exist in the local area, in addition to the community facilities that will be delivered by the Development. The Site is therefore in an accessible location and the Development will enhance this.

1.6.7 An analysis of the accessibility to services and facilities, particularly by sustainable transport mode, is contained in greater detail in the Transport Assessment, set out in Appendix 9.1 of this ES.

1.6.8 A detailed assessment of movement and accessibility is provided in Chapter 9 – Traffic and Transport, of this ES.

1.7 Ecology and Nature Conservation

1.7.1 No statutory designated sites for nature conservation are present within or immediately adjacent to the Site. Neither are there any internationally designated sites present within 5km of the Site. Four nationally designated sites exist within 2km of the Site. These are:

- Oakley Wood Site of Special Scientific Interest;

- Newhurst Quarry Site of Special Scientific Interest;
- Ives Head Site of Special Scientific Interest; and
- Beacon Hill, Hangingstone & Outwoods Site of Special Scientific Interest.

1.7.2 Non-statutory designated sites occurring within the Site include the Black Brook Local Wildlife Site (LWS) and Hermitage Estate LWS. The Black Brook LWS includes the Black Brook and river margins. The Hermitage Estate LWS includes wet woodland, semi-natural broadleaf woodland, semi-improved grassland and a lake.

1.7.3 The southern portion of the Site contains a broad range of trees in the form of dense woodland blocks, planted tree groups, individual specimen trees planted during the initial landscaping of Garendon Estate and naturally formed self-seeded trees positioned along hedgerows and watercourses. The majority of tree coverage within the Site stands within the dense woodland blocks which have been enhanced through additional planting to form dense ground cover for game rearing throughout the Site. Management of these woodlands has been undertaken regularly to harvest mature trees of value limiting the overall ages of the woodlands and presence of veteran trees. All of the woodlands include a variety of different tree ages due to natural self-seeding of young trees forming self-sustaining woodland cover contributing a high level of value and quality to the site. Typically a number of structural defects were noted on many specimens within the woodlands, however, these are commonly associated with woodland trees and are not considered significantly detrimental to their overall high value.

1.7.4 The northern portion of the Site provides only limited mature tree cover positioned along Black Brook, the watercourse bisecting the Site, and a number of small tree groups throughout the Site. Two woodland parcels stand towards the eastern portion of the Site providing a screen between the assessment area and residential development forming the eastern boundary. The remaining vegetation cover is in the form of a number of moderate to low quality hedgerows providing the individual field boundaries of the existing agricultural field parcels.

1.7.5 In respect of bats, the species assemblage recorded is considered to be unexceptional for a site of this size supporting a variety of habitats and given its geographic location. The species recorded over the course of the surveys comprise:

- Common pipistrelle;
- Soprano pipistrelle;
- Noctule;
- Brown long-eared;
- Daubenton's;
- Nathusius' pipistrelle;
- Myotis species.

1.7.6 Common pipistrelle and soprano pipistrelle were the most frequently recorded species. Whilst Nathusius' pipistrelle is a rare bat species it is widespread within the region and relatively low numbers were recorded on Site.

1.7.7 In respect of birds, the Site supports a relatively diverse range of farmland and woodland birds. These include a number of notable species listed as red or amber birds of conservation concern, as species of principal importance under the Natural Environment and Rural Communities Act 2006 or on Schedule 1 of the Wildlife and Countryside Act.

1.7.8 Badger surveys in 2013 identified a total of at least 37 badger setts (active and inactive). Badger activity was recorded as having a higher concentration to the north of the Black Brook which is likely to be due to the local topography and pattern of small field compartments. It is believed that the badger population in this area is representative of the local area with similar habitats present off site to the north east, north west, west and south.

1.7.9 The lakes and waterways also support a number of fish and invertebrate species as well as providing habitat features for reptiles.

1.7.10 A detailed assessment of the ecological and nature conservation baseline condition is provided in Chapter 10 – Ecology and Nature Conservation, of this ES.

1.8 Air Quality

1.8.1 An assessment of the baseline air quality in the vicinity of the Site has been undertaken from a number of sources and impacts. These comprise Air Quality Review and Assessment, Air Quality Monitoring, emission sources, meteorology and sensitive receptors.

1.8.2 Charnwood Borough Council is required under Section 82 of the Environment Act 1995 to conduct ongoing reviews and assessment of air quality within its area of jurisdiction. The assessments undertaken by the Council have indicated that concentration of both NO_2 and PM_{10} are above the relevant AQOs at locations of relevant public exposure. CBC has therefore designated four Air Quality Management Areas (AQMAs), one of which is Loughborough AQMA for the residential properties along the main arterial routes through Loughborough. This is located approximately 700m to the west of the Site, however, given the proximity of it to the Site it has been considered within this ES.

1.8.3 In respect of regular air quality monitoring the UK Automatic Urban and Rural Network (AURN) is a country-wide network of air quality monitoring stations operated on behalf of the Department for the Environment Food and Rural Affairs (DEFRA). Monitoring data for AURN sites is available from the UK National Air Quality Archive. None of the AURN monitoring locations lie within the extents of the Site and therefore these monitoring locations have not been considered further within this assessment.

1.8.4 As part of Charnwood Borough Council's continuous air quality monitoring, four monitoring stations are in place. The closest continuous monitoring sites to the Development are located on Durham Road and Baxter Gate. These lie 1.5km and 3km to the east of the Site, respectively. As such, given the proximity of these automatic stations, they are considered representative of air quality conditions within the study area. It is noted that the annual mean NO_2 AQO of 40$\mu g/m^3$ was exceeded in 2012 at the Baxter Gate monitoring location.

1.8.5 In addition to continuous air quality monitoring, the Council undertakes non-continuous monitoring, and 38 locations were monitored in 2012. Evidence has demonstrated that none of the 38 monitoring stations exceeded the require objective levels in 2012, however, due to the proximity of six of the monitoring locations to the Site, their results have been used within this ES.

1.8.6 In respect of emission sources, a desktop assessment has identified that traffic movements are likely to be the most significant local source of pollutants affecting the site and its surroundings. The principal traffic derived pollutants likely to impact local receptors are nitrogen dioxide and particulate matter. The assessment has therefore modelled all roads within the immediate vicinity of the Site which are considered likely to experience significant changes in traffic flow as a result of the Development.

1.8.7 For meteorological conditions, these have significant influence over air pollutant concentrations and dispersion. Pollutant levels can vary significantly from hour to hour as well as day to day, thus any air quality predictions need to be based on detailed meteorological data. The meteorological model calculates the dispersion of pollutants on an hourly basis using a year of local meteorological data. The meteorological data used in the assessment is derived from East Midlands Airport Meteorological Station. This is the nearest meteorological station which is considered representative of the Site, with all the complete parameters necessary for measuring meteorological conditions at the Site.

1.8.8 When measuring against sensitive receptors, the term 'sensitive receptors' includes any persons, locations or systems that may be susceptible to changes in abiotic factors as a consequence of the Development. These have been identified in the ES under ecological and exhaust emissions receptors.

1.8.9 A desktop assessment of ‘Designated’ ecological receptors (as defined within the Design Manual for Roads and Bridges Guidance on Air Quality Assessments) has been undertaken as well as a review of other potentially sensitive ecological receptors such as Local Nature Reserves (LNR) and Ancient Woodland. The ES uses a search radius of 2km radius of the Site boundary, to identify six potential ecological receptor sites. Each of these have been assessed in respect of the proximity to road links within the assessment area.

1.8.10 With respect to exhaust emission receptors the ES has identified 33 locations as the closest residences to each road which may be affected by the traffic associated with the Development. Vehicle exhaust emissions at each identified discrete receptor have been quantified using ADMS-Roads software package developed by Cambridge Environmental Research Consultants (CERC). This model is routinely used for environmental assessment work throughout the UK

1.8.11 A detailed assessment of the baseline and environmental effects for air quality is provided in Chapter 11 – Air Quality, of this ES.

1.9 Noise and Vibration

1.9.1 The ES has considered the effects of the Development on the noise at, and within, the vicinity of the Site during the construction and operational phases.

1.9.2 Potentially sensitive receptors located in the vicinity of the Site generally include residential premises which are located adjacent to the local road network. In addition, residential properties surrounding the proposed Site comprise the closest sensitive receptors with respect to construction noise. These are all considered to be receptors of high sensitivity.

1.9.3 The ES has identified the potential location of such sensitive receptors associated with Site. These comprise nearby residential properties, which are principally located off the A6(T), Hathern

Road, and the A512(T) as well as areas in the north western edge of Loughborough. The suitability of the Site for residential development has also been assessed.

1.9.4 Following the identification of the above receptors locations, fifteen noise monitoring stations were identified and surveys undertaken in 2013 during the daytime, evening and at night. This defined the baseline noise environment at and around the Site upon which to appraise future noise effects of the Development.

1.9.5 It is considered that the future baseline at the identified receptors will be broadly similar to the existing baseline given their locality to the local road network.

1.9.6 A detailed assessment of the baseline and potential effects of the Development is provided in Chapter 12 – Noise and Vibration, of this ES.

1.10 Hydrology and Water Quality

13.1.1 To assess the baseline hydrology issues at the Site and the surrounding area, a review of the following has been undertaken:

- Hydrological context;
- Flood risk;
- Existing surface water drainage regime;
- Water quality; and
- Water resources.

1.10.1 The Site is located within the Soar catchment, part of the wider River Trent catchment which eventually flows to the Humber Estuary, approximately 100km north east of the Site. There are three watercourses located within the Site: the Black Brook flows in an easterly direction through the northern part of the Site and is designated as 'Main River' according to the EA Flood Map; Oxley Gutter flows in an easterly direction through the middle of the Site and joins the Black Brook at two locations at and beyond the eastern Site boundary; and the Shortcliff Brook flows in an easterly direction through the southern part of the Site and joins the Burleigh Brook beyond the Site boundary to the east. Oxley Gutter and Shortcliff Brook are both classed as ordinary watercourses

1.10.2 In respect of flood risk, the Environment Agency Flood Maps show that the majority of the Site is located within Flood Zone 1. The land immediately either side of the Black Brook is classed as being within Flood Zones 2 and 3. The Oxley Gutter is not classed as Main River and, as such, is not included within the EA Flood Map. Part of the Shortcliff Brook is classed as Main River and the Flood Map shows that there is no flooding for the 1 in 100 year return period event (Flood Zone 3) or the 1 in 1,000 year return period event (Flood Zone 2) associated with the Shortcliff Brook within the Site

1.10.3 Drainage wise, two ridges run across the Site from west to east, sloping down in an easterly direction. One ridge is located in the northern part of the Site, north of the Black Brook. The other ridge is located in the southern part of the Site. In the centre of the Site, between these two ridges, is an area of relatively flat land, in which flows the Black Brook and Oxley Gutter.

1.10.4 Surface water run-off flows south from the northern ridge, towards the Black Brook. Surface water run-off from the central area of the Site drains to the Black Brook and Oxley Gutter. The southern part of the Site, south of the southern ridge, drains towards the Shortcliff Brook.

1.10.5 The existing Site is predominantly undeveloped with only a few farm buildings and access routes. As such, the discharge rate for the existing Site has been approximated by the greenfield runoff rate based on generalised soil and permeability conditions for the 1 in 100 year storm event.

1.10.6 In respect of water quality, the Black Brook is located within the River Basin Management Plan (RBMP) for the River Humber. The RBMP shows that the current ecological status of the Black Brook is 'Poor'. Information for Oxley Gutter and Shortcliff Brook is not given. In its response to the ES Scoping Report for the Development (dated 12th March 2014), the Environment Agency stated that the current status/potential for the Black Brook to be 'Poor', Oxley Gutter to be 'Poor' and the Shortcliff Brook to be 'Moderate'.

13.1.2 The water supply to the surrounding area and existing buildings on the Site is provided by Severn Trent Water (STW). STW's Water Resources Management Plan (WRMP, 2010) shows that the Site is located within the East Midlands Water Resource Zone (WRZ). This WRMP states that, at the end of 2019, this Zone the supply shortfall will be 35Ml/d and by the end of 2034/35 this will increase to 65Ml/d. Within the WRMP, only the WRZ covering the Birmingham area has a greater shortfall by either 2019 or 2034/35.

1.10.7 A detailed assessment of the baseline and Development effects is provided in Section 13 – Hydrology and Water Quality, of this ES.

1.11 Geology and Ground Conditions

1.11.1 The majority of the Site is owned by the Garendon Park Estate and the land is in agricultural use, mainly in arable production but with some grassland used for horse livery. In terms of the effects of the proposals, this ES has assessed both the construction and operational phases of the Development.

1.11.2 During the operational phases of the Development and as it progresses through a number of phases, the consequential effects on agriculture and soils will be gradual and progressive over the life of the Development. In its operational phase, the effects will be permanent where agricultural land is lost, although the Development proposes the retention and enhancement of significant amount of agricultural land and soils.

1.11.3 In respect of minerals, the northern part of the Site lies within a Sand and Gravel Mineral Consultation Area (MCA). The geology of the Site demonstrates that the superficial deposits are not materials which are suitable for extraction and use. The sand and gravel deposits are confined to the narrow alluvial plain of the Black Brook and the adjacent poorly defined low terraces, where the deposits are thin and of low quality. It is considered therefore that they would not represent viable potential aggregate-bearing deposits.

1.11.4 The southern western extremity of the Site, adjacent to Junction 23 of the M1, lies within an Igneous Rock MCA. This corresponds with a 500 meter buffer zone around Charnwood Quarry. The Development is unlikely to have an adverse effect on any remaining mineral resources at this quarry.

1.11.5 As a consequence, it is considered that the superficial deposits on the Site do not constitute potential aggregate minerals, and the underlying mudstone is not regarded as being of any commercial use or value today. Consequently, it is concluded that built development on this Site would not cause the sterilisation of any minerals.

1.11.6 A detailed assessment of soils, geology and ground conditions is provided in Chapter 14 – Geology and Ground Conditions, of this ES.

1.12 Alternatives

1.12.1 In Scoping the ES with Charnwood Borough Council it was set out that the proposals represents a major urban extension to Loughborough Town which has been considered and appraised through an extensive Development Plan preparation process. This process has considered all reasonable alternative locations for the provision of a SUE of approximately 3,000 dwellings, and concluded that the extension to the West of Loughborough represents the most appropriate sustainable location.

1.12.2 The ES Scoping Report submitted to the Council outlined the Council's approach to selecting the extension to the West of Loughborough and concluded that the Development Plan work to date had been extensive and subject to a rigorous and iterative Sustainability Appraisal and Strategic Environmental Assessment.

1.12.3 In addition to the Council's appraisal of alternatives through its Development Plan process, the Consortium undertook an assessment of deliverable sites contained within the Council's Strategic Housing Land Availability Assessment (SHLAA) around Loughborough, to establish if any one of them individually or cumulatively could deliver an urban extension to Loughborough. The assessment of sites within the Council's SHLAA identified that there were no reasonable alternative locations for a SUE of up to 3,200 dwellings on the edge of Loughborough.

1.12.4 Given the above, it was set out in the ES Scoping Report that the ES would not consider alternative locations for an urban extension of approximately 3,200 dwellings and that the ES will focus on alternative land use arrangements for the Development and demonstrate how these have informed the current proposals.

1.12.5 It was requested within the ES Scoping Report that should the Council require the ES to consider alternative site locations, that the Council expressly state this within its Scoping Opinion. No such direction was included within the Council's Scoping Opinion.

1.12.6 A detailed assessment of alternative development configurations is provided in Chapter 15 – Alternatives, of this ES.

1.13 Cumulative and Indirect effects

1.13.1 It is a requirement to consider cumulative and indirect effects of proposals within the ES. Cumulative and indirect effects are assessed appropriately within each Chapter of this ES. From the appraisal work undertaken it is concluded that the urban extension is self-contained and that significant cumulative and indirect effects are likely to only arise in respect of transportation issues, as set out in Section 7 of the Scoping Report. These are specifically in respect of development within the locality and at Shepshed. It was requested through the ESScoping Report that if Charnwood Borough Council was not of the same opinion, that this be stated within

its Scoping Opinion, alongside any relevant proposals that should be included within the assessment of cumulative effects. The Council's Scoping Opinion did not express that any further proposals should be considered.

1.13.2 However, to ensure that all cumulative effects have been considered, the ES has considered cumulative effects in relation to the following proposals:

- Loughborough University Science and Enterprise Park;
- Biffa Waste Incinerator;
- Dishley Grange Employment Site; and
- Off-site highway improvements / Ashby Road widening.

1.13.3 An assessment of the cumulative and indirect effects for the Development, is contained within each individual Chapter of the ES, and a summary is provided in Chapter 16 – Cumulative Effects, of this ES.

1.14 Difficulties in Preparing the ES

1.14.1 Schedule 4 of the Environmental Impact Assessment Regulations (2011) sets out that the ES should include an indication of any difficulties encountered in preparing the ES. There were no overriding or significant constraints, or difficulties encountered in preparing this ES. Each Chapter of this ES provides a review of the baseline evidence collated and the methodology involved in appraising significant effects, including commentary of any specific difficulties that may have arisen in preparing the ES Chapter.

2 DEVELOPMENT PROPOSALS

2.1 Description of Development

2.1.1 The application is for a residential-led mixed use development up to 3,200 dwellings, 16ha of employment land, a Community Hub, public open space, restoration of Garendon Park and heritage assets, and the provision of associated infrastructure. The Development proposals' description is as follows:

"Outline planning permission for residential development up to 3,200 dwellings; up to 16ha of employment land of B1/B2 and B8 uses; a mixed use Community Hub of up to 4ha comprising a local convenience retail unit (2,000 sqm); up to 1,000 sqm of other A1 retail, A2 financial and professional services, A3 food and drink, B1 business and D1 uses; sites for Gypsy, Travellers and Travelling Showpeople provision totalling 1ha; two primary schools up to 2ha each; strategic open space including allotments; access roads and new Strategic Link Road; open space / landscaping and associated works; principal means of access; restoration of Garendon Park and assets; all other matters to be reserved."

2.1.2 This Chapter of the ES provides a description of the Development in terms of the overall concept and disposition of land uses, design philosophy and more detailed elements of the Development that are to be fixed through the submitted outline planning application.

2.1.3 The Site area measures 466ha and the table below sets out the proposed land use budget of the Site as shown on the illustrative Masterplan.

Table 2.1 Land Use Budget

Land Use	Hectares
Residential Development	101.2
Employment Land	16
Community Hub	4
Primary Schools	4
Gypsy Traveller and Showman Sites	1
Public Open Space	13
Formal Sports Provision	9
Allotments	2.5
Garendon Park	188
Total Provision	**466**

2.2 Layout and Scale

2.2.1 Layout, scale, landscaping and non-principal means of access are all matters to be reserved. However, the following Parameter Plans (reproduced at Appendix 2.2) are submitted with the application which provide indicative details in relation to layout and scale of the Development:

- Application Boundary plan;
- Land Use plan;
- Residential Density and Building Heights plan;
- Access plan;
- Green Infrastructure plan; and
- Phasing plan.

2.2.2 In relation to the layout, the illustrative Masterplan (Appendix 2.1) indicates the approximate location of buildings, routes, and open spaces, and establishes the principle of development for the SUE.

2.3 Residential Development

2.3.1 The Development will provide up to 3,200 dwellings across the identified locations situated in the area of land outside of Garendon Park. The residential area will be delivered in phases. Also included within the Development will be community and employment uses and a significant amount of public open space. The community uses proposed include two new primary schools and a Community Hub.

2.3.2 The residential element of the Development will include a mix of housing of a range of different sizes and tenures to contribute to the sustainable provision of housing required for the Loughborough area. This will include affordable housing provision in compliance with the Local Planning Authority's requirements.

2.3.3 Gypsy, Travellers and Travelling Showpeople site provision is also provided within the Development in accordance with the Council's emerging Core Strategy requirements.

2.4 Access

2.4.1 There are a number of proposed vehicular access points into the Site, with the principal two being from the A512(T) Ashby Road to the south of the Site and at the A6(T) Derby Road to the north. A third access will be from Hathern Road to the northwest of the Site. While not a principal access, the Site will also be accessible from the west at Derby Road.

2.4.2 Traffic generation is proposed to be mitigated through public transport improvements and a network of pedestrian footways and cycleways to be delivered as part of the comprehensive Development. This will provide linkages throughout the Development as the Illustrative Masterplan indicates in Appendix 2.1.

2.5 Employment

2.5.1 An area of up to 16ha of Class B1/B2/B8 use development is proposed within the northern part of the Site adjacent to the Community Hub. Employment will also be provided through the restoration of Garendon Park and the re-use of heritage assets for alternative uses where viable, particularly for Park visitor facilities. Employment will also be provided within the Community Hub through a mix of retail and service facilities.

2.6 Community Hub, Education and Community Facilities

2.6.1 A Community Hub will be provided on 4ha of land adjacent to the High Street and southern primary school in the central area of the Development. This will include a 2,000 sqm anchor retail store, up to 1,000 sqm of other A1 retail, A2 financial and professional services, A3 food and drink, B1 business or D1 non-residential institutions will be included. There will not be any other retail units greater than 100sqm.

2.6.2 Two primary schools are also proposed with one located in the parcel of development north of the Black Brook, and one in the southern parcel adjacent to the Community Hub. These will accommodate the rise in primary age children to the area.

2.6.3 In respect of other education provision, the Local Education Authority has confirmed that at this time there is no requirement for a financial contribution towards secondary school provision or inclusion of a secondary school on the Site. This is due to suitable capacity within existing schools within close proximity to the Site.

2.7 Public Open Space

2.7.1 Areas totalling at least 22.8ha of land for open space, sport and recreation, as required by the emerging Charnwood Borough Core Strategy Policy CS22 for the Development, will be included within the Site in addition to a substantial increase in public access to Garendon Park, which is not open to the public at present. The principal area of formal recreation is proposed in the Black Brook valley north of the Community Hub. Recreation will be encouraged at an appropriate level within Garendon Park. A Community Park is proposed on Hathern Hill in the north west of the Development. In addition, a network of green spaces and play areas is proposed throughout the Development to optimise the Site characteristics and accessibility of new facilities to residents. A three court indoor sports hall and lit all-weather pitch are proposed at the Community Hub.

2.7.2 Open space within the Development will also include areas which are proposed for specific management with the objective of encouraging ecological diversity including areas for sustainable urban drainage.

2.7.3 Linkages will be provided through the Development with the network of existing rights of way and new routes becoming integrated to ensure there is extensive, safe and convenient access to green spaces within and adjoining the Site.

2.7.4 The strategic open space and landscaping associated with the Development will also act as a ‘green lung’ across the whole of the Site, in part providing a buffer between the existing residential area of Hathern Village, Garendon Park and the Development. This will provide a ‘garden suburbs’ context.

2.8 Heritage Assets

2.8.1 At present there is no public access to Garendon Park, with areas under intensive arable use and lacking features of landscape value. The existing historic buildings and monuments are also in need of major repair.

2.8.2 As a result of the Development, a number of the existing arable fields will be converted to species rich grazing pasture with avenues of parkland trees and improved landscape and views. The existing buildings and monuments will be restored and enhanced and alternative uses investigated, including visitor facilities. In addition, a long term Conservation Management Plan is being prepared for the Park and heritage assets to secure a long term sustainable future for the Park.

3 EIA METHODOLOGY AND NON SIGNIFICANT EFFECTS

3.1 Introduction

3.1.1 Circular 02/99 in respect of the Environmental Impact Assessment was replaced on the 6 March 2014 by the national Planning Practice Guidance (PPG) advice (http://planningguidance.planningportal.gov.uk/). This Guidance identifies that the purpose and main aim of Environmental Impact Assessment (EIA) is to protect the environment by ensuring that a Local Planning Authority considering a project that is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process. This incorporates the previous theme of the superseded circular.

3.1.2 In addition however, the PPG now identifies at Paragraph 002 another aim of EIA as being to ensure that the public are given early and effective opportunities to participate in the decision making procedures.

3.1.3 This ES has been prepared consistent with Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

3.1.4 When screening Schedule 2 projects, the Local Planning Authority must also take account of the selection criteria in Schedule 3 of the Regulations. Schedule 3 selection criteria considerations relate to the size of the development, the accumulation with other development use of natural resources, production of waste, pollution or nuisance and the risk of accidents.

3.1.5 It is important to remember that the basic test of the need for EIA in particular cases is the likelihood of significant effects on the environment. It is also worth considering whether those effects can only be considered within an Environmental Statement, bearing in mind Local Planning Authorities already have a well-established general responsibility to consider the environmental implications of developments which are subject to planning control.

3.1.6 Taking into account the nature and scale of the proposals it is apparent that a significant effect is likely and therefore the proposal is to be considered as EIA development.

3.2 EIA Screening and Scoping

3.2.1 Acknowledging that only likely significant environmental effects will need to be considered through an ES, the applicant may request an opinion from the Local Planning Authority about what the main effects of the development are likely to be. It advises that the applicant may wish to indicate what the main issues are likely to be.

3.2.2 The Consortium has been working with Charnwood Borough Council through a pre-application Steering Group as part of a Planning Performance Agreement process. Through this, appropriate screening was undertaken and it was agreed that the application was an EIA application for the purposes of Schedule 2 of the EIA Regulations and is likely to give rise to significant environmental effects.

3.2.3 Following the agreement that the application is an EIA application, the Consortium prepared a Scoping Report, referring to the various elements of environmental information that exist and how

the ES would contain information as is reasonably required to assess the effects of the Development referred to in Part I, of Schedule 4, of the 2011 Regulations.

3.2.4 Following the Council's consideration of the ES Scoping Report, it issued its Scoping Opinion as reproduced at Appendix 3.1, which has informed the scope of the ES and its Chapters.

3.2.5 It is the opinion of Charnwood Borough Council that the following matters be addressed within the ES in accordance with the ES Scoping Report and associated appended letter dated 1 May 2014 (Appendix 3.1 refers):

- Landscape and Visual Impact;
- Traffic and Transport;
- Noise and Vibration;
- Air Quality;
- Ecology and Nature Conservation;
- Socio Economic Factors;
- Hydrology and Water Quality;
- Geology and Ground Conditions;
- Archaeology; and
- Heritage.

3.2.6 The ES therefore, considers the main or significant environmental affects the Development may give rise to in the following Chapters:

i) Socio-Economic Effects – construction effects on employment; completed development effects on education, health services, public open space and recreation, access to housing provision, crime, and the economy (Chapter 5 refers);

ii) Landscape and Visual Amenity – construction and completed development effects on public viewpoints and receptors (Chapter 6 refers);

iii) Archaeology and Heritage – construction and completed development effects on Garendon Park and any significant heritage assets in other parts of the Site (Chapters 7 and 8 refer);

iv) Traffic and Transport – construction and completed development effects of change in traffic flows on local roads, receptors and pedestrian amenity; public transport accessibility; pedestrian and cycle accessibility; driver delay; safety; and potential severance (Chapter 9 refers);

v) Ecology and Nature Conservation – construction and completed development effects on identified important habitats and ecological receptors (Chapter 10 refers);

vi) Air Quality – construction and completed development effects having regard to traffic impacts on residential development and other sensitive receptors and construction dust (Chapter 11 refers);

vii) Noise and Vibration – construction and completed development effects having regard to traffic impacts on residential development and other sensitive receptors (Chapter 12 refers);

viii) Hydrology and Water Quality – construction and completed development effects on the hydrology of the area including the potential for flooding risk (Chapter 13 refers);

ix) Geology and Ground Conditions – construction and completed development effects on the soils and geology of the area (Chapter 14 refers);

x) Alternatives – an assessment of alternative configurations of delivering the development proposals leading to the current proposal (Chapter 15 refers); and

xi) Cumulative Effects – an assessment of the cumulative impacts of the Development (Chapter 16 refers).

3.3 Non-Significant Environmental Effects

3.3.1 From the Council's Scoping Opinion, it is clear that human beings (social economic), flora, heritage, archaeology, fauna, landscape, noise, soils, landscape and water are identified for assessment through this ES. As a result, they are all o included within the ES.

3.4 EIA Methodology and Structure of Environmental Statement

3.4.1 Having regard to the content of the ES and as addressed above, this method statement sets out the project context including the role of the ES and the description of the consultant team, setting out their responsibilities and areas of expertise. The Chapters of the ES will conform, where appropriate, to the following standardised EIA sections.

3.5 Introduction and Study Area

3.5.1 This will provide comments on the objectives of the ES and its role specifically in relation to the Landscape and Visual impact, Archaeological and Cultural Heritage impact, Ecology and Nature Conservation, Social-Economic Factors, Traffic and Transport, Noise, Geology and Ground Conditions, and Air Quality impact. This also defines the study area for each discipline. A systematic analysis approach of environmental information will be used to identify potential impacts, evaluate their effects and refining the proposals to mitigate adverse effects.

3.6 Legislation, Policy and Guidance (specific to discipline)

3.6.1 This will establish and assess all the relevant environmental legislation, policy and guidance criteria of relevance to the subject area.

3.7 Assessment Methodology and Significance Criteria

3.7.1 A range of criteria will be used to determine the significance of predicted effects with reference to specific issues in subsequent sections of the ES. Effects will be assessed quantitatively where possible, although specific areas will necessitate informed qualitative assessments. Those effects

which are to be considered to be significant prior to mitigation will be identified in the ES, with any residual effects following mitigation addressed in detail.

3.7.2 Environmental effects can be either 'Beneficial' or 'Adverse' and includes direct and indirect effects, short, medium and long term, permanent and temporary, cumulative, positive and negative effects (unless otherwise stated). For the purposes of this ES it is assumed that short term should be considered to be the construction period, that is, the period leading up to completion of the scheme (anticipated to be circa 15 years). For use within this ES, long term should be considered to be the period between completion of the Development and 25 years post completion (operational stage).

3.7.3 For the most relevant identified effects, the magnitude of the effect is categorised as follows: Very High; High; Moderate; Low and No Change.

3.7.4 The overall significance of each effect is determined by assessing its magnitude against the sensitivity of the environmental receptor and any other relevant factors such as the number and activities of people affected. Significance is categorised throughout as: Major; Moderate; Minor or Negligible/No Effect.

3.7.5 The above significance criteria have therefore been used in the ES, unless indicated in the relevant Chapter to comply with industry standards, or a more Chapter subject specific relevant approach.

3.8 Existing Baseline Conditions

3.8.1 The environmental character of the Site is established through baseline studies. Natural and man-made processes, which are currently present, may already be altering and may continue to alter the character of the Site in the future. These processes will be identified in the research.

3.8.2 Following the initial work already undertaken on baseline surveys, including the consultations entered into with various stakeholders, additional baseline work and surveys that have been commissioned will be detailed within the relevant ES Chapter.

3.9 Assessment of Impacts, Mitigation and Residual Effects

3.9.1 These assessments are combined for clarity and to prevent repetition within the ES:

- Impact Assessment - The interaction of the Development with the existing identified baseline conditions and potential future Site conditions will be considered and impacts predicted. An assessment will be made as to the significance of the predicted impacts, in terms of nature, by extent of magnitude for the Development both during the construction and operational stages of the Development as indicated above;

- Scope for Mitigation/Enhancement Measures - Appropriate mitigation measures, incorporating design and operational proposals, to seek to minimise the effect of adverse impact and enhance beneficial positive impacts will be outlined; and

- Residual Effects - Following the mitigation and enhancement measures, a statement of the significance of the resulting impact will be provided in relation to each aspect of the environment considered.

3.10 Cumulative and Indirect Effects

3.10.1 These assessments are combined for clarity and to prevent repetition within the ES:

- Cumulative Effects - A statement will be provided on the impacts that result from incremental changes caused by other past, present or reasonable foreseeable actions together with the Development; and
- Indirect Effects - A statement will be provided on the impacts on the environment, which are not a direct result of the Development, often produced away from that result from incremental changes caused by other past, present or reasonable foreseeable actions together with the Development.

3.10.2 Descriptions of the aspects of the environment which would potentially be affected by the Development have been prepared by the consultant team, as indicated below, and are structured within the following Chapters of the report:

Chapter 4 – Planning Policy (RPS Planning)

Chapter 5 – Socio Economic Factors (RPS Planning)

Chapter 6 – Landscape and Visual Amenity (FCPR)

Chapter 7 – Archaeology (CgMS)

Chapter 8 – Cultural Heritage (Heritage Collective)

Chapter 9 – Air Quality (WYG)

Chapter 10 – Ecology and Nature Conservation (FPCR)

Chapter 11 – Hydrology and Water Quality (Peter Brett Associates)

Chapter 12 – Noise and Vibration (WYG)

Chapter 13 – Traffic and Transport (WYG)

Chapter 14 – Geology and Ground Conditions (Land Research Associates and Wardell Armstrong)

Chapter 15 – Alternatives (RPS Planning)

Chapter 16 – Cumulative Effects (RPS Planning and WYG)

Chapter 17 - Conclusion (RPS Planning)

4 PLANNING POLICY

4.1 Introduction

4.1.1 This Chapter considers the Plans and policies relevant to the ES of the proposed residential-led mixed-use development at the Site. The aim is to detail the policy guidance at international, national and local levels, and demonstrate whether or not the Development is consistent with current and emerging policy. An extract of the Charnwood Local Plan Core Strategy Allocation in Draft Policy CS22 is included at Appendix 4.1.

4.1.2 The Development Plan includes a number of site and area-specific policies for the Site, which provide the context for assessing the impact of the Development, as set out in this ES and the other supporting documents. The implications of the proposals and their relationship to existing and emerging policy relates to all policies of relevance to the planning application and therefore also extends beyond the immediate Site boundary.

4.2 Environmental Impact Assessment Regulations 2011

4.2.1 The Town and Country Planning (Environment Impact Assessment) Regulations 2011 – SI 2011 No.1824 implement the EIA directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment in so far as it applies to development under the Town and Country Planning Act 1990.

4.2.2 This Development has been assessed as a project for which an EIA is required.

4.3 National Planning Policy Framework

4.3.1 The National Planning Policy Framework (NPPF) published in March 2012 replaces guidance and policy previously set out within Planning Policy Statements and Planning Policy Guidance Notes. The NPPF identifies three dimensions to sustainable development (paragraph 7 refers), which provide a holistic approach to development that will help to deliver balanced communities. To deliver these dimensions, the following roles need to be performed by the planning system:

- ***"an economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;***

- ***"a social role – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and***

- ***"an environmental role – contributing to protecting and enhancing our natural, built and historic environment; and as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy."***

4.4 Planning Policy Guidance

4.4.1 On 6 March 2014 the Government published its national Planning Practice Guidance (PPG) to complement the NPPF. The PPG is a web-based set of guidance notes covering 41 topic areas, flexible to be updated accordingly. The purpose of the guidance is to clarify some of the statements made in the NPPF. As such both sets of information should be read together.

4.4.2 Relevant contents of the NPPF and the PPG is summarised below, alongside an assessment of the Development's compliance. A positive symbol represents consistency with the relevant policy whereas a minus symbol represents non-consistency:

Table 4.1 Policy Compliance with NPPF and PPG

Policy	Commentary	Compliance
Sustainable Development, *(Paragraph 14 NPPF)*	The NPPF emphasises a 'presumption in favour of sustainable development' which should be seen as a golden thread for both plan-making and decision-taking by Local Planning Authorities. The guidance identifies three dimensions to sustainable development: economic, social and environmental.	+
Transport *(Section 4 of the NPPF and overarching principles on Travel Plans, Transport Assessments and Statements within the PPG)*	Local Planning Authorities are, through local plan policies, to encourage the delivery of sustainable modes of transport to reduce the need to travel by car. Developments should be encouraged which are located in sustainable locations reducing the need to travel, and maximising sustainable forms of transport. When determining local parking standards a range of issues should be taken into account including accessibility, type and use of development, and public transport opportunities. Proposals which generate significant movements may require travel plans and/or travel assessments to understand the implications of development. They should advise of appropriate mitigation measures and encourage modes of sustainable transport.	+
Housing *(Section 6 of the NPPF)*	The Government's intention is to significantly increase the supply of housing, providing a good supply and range of housing whilst ensuring identified housing needs of local communities are met. This should include the identification of key sites which are critical to the delivery of the housing strategy over the plan period.	+

Policy	Commentary	Compliance
Design *(Section 7 of the NPPF and Design principles of the PPG)*	Good design is a key component of sustainable development, contributing positively to creating places better for people. This can be achieved using high quality design approach to public and private spaces as well as to buildings. High quality design can be met by ensuring that spaces are: • Functional; • Support mixed uses and tenures; • Include successful public spaces; • Are adaptable and resilient; • Have a distinctive character; • Are attractive; • Encourage ease of movement.	+
Communities *(Section 8 of the NPPF and Health and Wellbeing guidance in the PPG)*	The NPPF encourages developments to facilitate social interaction and the creation of healthy and inclusive communities through integrated and accessible community facilities and public spaces. The PPG is supportive of proposals which encourage healthy living environments for physical activity and active travel. Proposals should also be adaptable to changes in local demographics in supporting the reduction of health inequalities.	+
Flooding *(Section 10 of the NPPF and Flood Risk and Coastal Change guidance in the PPG)*	The NPPF strongly advises directing development away from areas of high flood risk and safeguarding land for future flood management. Site specific Flood Risk Assessments should demonstrate the long term protection of development sites and the impact of potential to reduce overall fluvial or coastal flood risk.	+
Natural Environment *(Section 11 of the NPPF and Natural Environment Guidance in the PPG)*	Local Planning Authorities are to take into account the roles and characters of different areas, promoting the vitality of main urban areas and protecting the environment. The aim to meet development needs should be to minimise pollution and other adverse effects on the local and natural environment	+
Heritage *(Section 12 of the NPPF and Conserving and enhancing the historic environment of the PPG)*	Local Planning Authorities should look for opportunities for new development within the setting of heritage assets to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to or better reveal the significance of the asset should be treated favourably. In determining planning applications, Local Planning Authorities should take account of the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation. Regarding buildings, the PPG advises that heritage assets in decay are best addressed by ensuring they remain in active use, consistent with their conservation.	+

4.5 Development Plan

4.5.1 Following the revocation of the Regional Spatial Strategy for the East Midlands in 2013, together with the saved policies of the Structure Plan, the Development Plan at the point of submission of the application form comprises the saved policies of the Charnwood Local Plan (2004). Relevant planning policies within the Charnwood Local Plan have been considered below.

Charnwood Local Plan (2004)

4.5.2 The following policies were saved by the Secretary of State on 21st September 2007 and are relevant to the Development as summarised below.

Table 4.2 Policy Compliance with Charnwood Local Plan

Policy	Commentary	Compliance
ST/1 – Overall Strategy for Charnwood	The overall strategy is to promote sustainable patterns of development.	+
ST/2 – Limits to Development	Built development will be confined to allocated sites and other land within the limits to development identified on the proposals map.	-
ST/3 – Infrastructure	When granting permission the Borough Council will seek to ensure that the provision of necessary infrastructure is secure by entering into a legal agreement to provide appropriate infrastructure, including: • Highways, public transport and storm drainage • Facilities providing for the social, educational, recreational or community needs of the development • Affordable housing	+
EV/1 – Design	The Council will seek to ensure high standards of design in all new developments.	+
EV/2 – Nationally Important Archaeological Sites	Planning permission will not be granted for development which would adversely affect a Scheduled Ancient Monument or other nationally important archaeological site, or its setting.	+
EV/8 – Buildings of Local Historic or Architectural Interest	Planning permission for development which would affect a building of local historic or architectural interest or setting will be granted where: • the appearance or character of the building and its setting are safeguarded; or • the development would result in significant local community or environmental benefits.	+

Policy	Commentary	Compliance
EV/9 – Historic Parks and Gardens	Planning permission will not be granted for development which would have an adverse effect on the character and setting of parks and gardens of historic or landscape significance.	+
EV/20 – Landscaping in New Development	Planning Permission will be granted where a high standard of appropriate landscaping is provided.	+
EV/22 – Sites of Regional, County and District Level Ecological or Geological Importance	Planning permission will not be granted for development which would adversely affect county and district level sites of ecological interest or LNRs unless an overriding strategic need can be shown which exceeds the level of importance for nature conservation.	+
EV/29 – Access to Watercourse for Maintenance	Planning permission will not be granted for development within 8 metres of the top of the bank or within 8 metres of the landward toe of a flood bank or other flood defence on all main rivers and other watercourses which would obstruct access for future maintenance.	+
H/5 – Affordable Housing on Unallocated sites	On proposals for housing developments the Council will seek to negotiate the provision of affordable housing with schemes.	+
H/9 – Assessment of Gypsy Site Proposals	In determining applications, sites will be judged against the identified need, location, scale, landscaping, access /connectivity and use classes to ensure the proposal is commensurate to the location.	+
H/10 – Assessment of Travelling Showpeople Site Proposals	Proposals will need to justify that they can safely connect to the main road network, provide adequate screening and ensures that any non-residential elements will not significantly affect the amenity of adjacent properties.	+
H/16 – Design and Layout of New Housing Developments	All new developments will be expected to deliver high standards of design and layout.	+
CT/1 – General Principles for Areas of Countryside, Green Wedge and Local Separation	Land lying outside the defined Limits to Development is variously identified on the Proposals Map as Countryside, Green Wedge and Areas of Local Separation. Development within these areas of generally open land will be strictly controlled. In all cases it should be demonstrated that the Development could not reasonably be located within or adjacent to an existing settlement.	-

Policy	Commentary	Compliance
CT/2 – Development in the Countryside	In areas defined as Countryside, development(s) acceptable in principle will be permitted where it would not harm the character and appearance of the countryside and provided it could safeguard its historic, nature conservation, amenity, and other local interest.	+
CT/3 – Development in Green Wedges	In the Green Wedge areas, development acceptable in principle will be permitted where it would: • protect the predominately open and undeveloped character of the area; and • be consistent with safeguarding the area's function to provide, strategically important separation between settlements; The green wedges are defined on the Proposals Map. They include land between Loughborough and Shepshed.	-
TR/5 – Transport Standards for New Development	Large residential proposals of greater than 25 units or 1ha of employment land will be supported where the development demonstrates a commitment to non-car modes of transport. This includes capability of being served by sustainable modes of transport and ensures connectivity to the wider bus network.	+

4.6 Emerging Planning Policy

4.6.1 While the Masterplanning of the Site has taken appropriate account of the saved Local Plan Policies, the Council submitted its emerging Development Plan (Core Strategy) to examination on 20 December 2013 and this is a material consideration in the determination of the application, and on the composition of the Site. The Examination of the Plan is currently suspended for nine months from April 2014 under the recommendation of the Inspector examining the Plan, for the Council to prepare further evidence supporting the level of housing need for the Borough. However, the emerging Development Plan Policies can be attributed significant weight given the advanced stage of the Core Strategy. Furthermore, the evidence base underpinning the Development Plan process, and allocation of the SUE, can be taking into account on the basis that it is considered robust and reasonable.

4.6.2 Of relevance to the Site are the following emerging Development Plan Policies:

Table 4.3 Policy Compliance with Emerging Development Plan Policies

Policy	Commentary	Compliance
CS 1 – Development Strategy	The majority of the Borough's remaining growth will be met at Loughborough and Shepshed where at least 6,450 homes and up to 22 hectares of employment land will be delivered by 2028. It will do this by planning positively for: • a sustainable urban extension of approximately 3,000 homes, delivering at least 2,500 homes and up to 16 hectares of land by 2028 and the remaining homes beyond the plan period as part of a comprehensive and integrated development.	+
CS 2 – High Quality Design	Charnwood BC will require new developments to make a positive contribution to Charnwood, through high quality, inclusive design and, where appropriate, architectural excellence. Proposals should respond positively to their context and reinforce a sense of place.	+
CS 3 – Strategic Housing Needs	Will seek a delivery of 30% affordable housing provision on development of the Sustainable Urban Extension.	+
CS 5 – Gypsy, Travellers and Travelling Showpeople	We will meet the needs of the Gypsy and Traveller Community by 2028 by: • requiring a site for 4 permanent pitches at each of our allocated sustainable urban extensions in accordance with policy CS22; and • requiring a site for 4 showpeople plots at each of our strategic housing developments in accordance with policy CS22.	+

Policy	Commentary	Compliance
CS 6 – Employment and economic development	By 2028 Charnwood borough Council will meet the economic needs of the community and support the economy of Leicester by: • Delivering up to 75 hectares of land for strategic employment purposes in accordance with Policy CS1; • Supporting the expansion of the Science and Enterprise Park on up to 77 hectares of land in accordance with Policy CS23; • Encouraging a greater proportion of high technology and knowledge based businesses; • Providing opportunities for manufacturing businesses to develop, re-locate and expand; • Providing opportunities for small-scale, high quality business units and offices; • Promoting business and employment regeneration opportunities that are accessible to the Priority Neighbourhoods; and • Supporting major employment opportunities in locations where they reduce journeys to work by car.	+
CS 11 – Landscape and countryside	New developments will need to respect the local landscape character, accounting for sense of place and locally distinctive features.	+
CS 12 – Green Infrastructure	The Borough Council will protect and enhance the Urban Fringe Green Infrastructure Enhancement Areas by: • Enhancing our network of green infrastructure assets through strategic developments in accordance with Policies CS19, CS20, CS21, CS22, CS23 and CS24; and • Addressing the identified needs in open space provision.	+
CS 13 – Biodiversity and Geodiversity	Will support developments that protect biodiversity and geodiversity and those that enhance, restore or re-create biodiversity. We will expect development proposals to consider and take account of the impacts on biodiversity and geodiversity, particularly with regard to: • Sites of Special Scientific Interest; • Local Wildlife Sites; • Regionally Important Geological Sites; • UK and Local Biodiversity Action Plans priority habitats and species; • Protected species; and • Ecological networks.	+

Policy	Commentary	Compliance

CS 14 – Heritage	Conserve and enhance historic assets for their own value and the community, environmental and economic contribution they make by:
	
	• Requiring development proposals to protect heritage assets and their setting;
	• Support development which prioritises the refurbishment and re-use of disused or under used buildings of historic or architectural merit or incorporates them sensitively into regeneration schemes;
	• Supporting developments which incorporate Charnwood's distinctive local building materials and architectural details;
	• Supporting the viable and sustainable use of heritage assets at risk of neglect or loss, providing such development is consistent with the significance of the heritage asset, especially where this supports tourism or business development;
	• Securing improvements to the following 'at risk' heritage assets through our major developments:
	  ○ The Temple of Venus, Garendon Park, Ashby Road, Loughborough
	  ○ The Triumphal Arch, Garendon Park, Ashby Road, Loughborough
	  ○ Garendon Park, Ashby Road, Loughborough
		+

CS 15 – Open spaces, sports and recreation	Require new developments to meet the standards set out in the Open Spaces Strategy, having regard to local provision and viability. In addition, sustainable urban extensions should include planned open spaces which contribute positively towards the local provision.	+
CS 16 – Sustainable construction and energy	Encouraging sustainable design and construction and the provision of renewable energy where it does not make a development unviable.	+
CS 17 – Sustainable Travel	Seek to achieve a 6% shift from travel by private car to walking, cycling and public transport by; • Securing contributions from sustainable urban extensions towards improvements to public transport corridors into Leicester City and Loughborough in accordance with Policy CS19, CS20 and CS22.	+

Policy	Commentary	Compliance
CS 18- Local and Strategic Road Network	Will maximise the efficiency of the local and strategic road network by 2028, by: • requiring our strategic developments to deliver an appropriate and comprehensive package of transport improvements in accordance with Policies CS19, CS20, CS21, CS22, CS23 and CS24; and • requiring other network improvements as identified by appropriate Transport Assessments.	+
CS 22 - West of Leicester Sustainable Urban Extension	Allocate land to the west of Loughborough as a sustainable urban extension to deliver a community of approximately 3,000 homes. The development will make a significant contribution to meeting the areas housing needs by delivering at least 2,500 homes by 2028 and the remaining homes beyond the plan period. The proposal will contribute towards the provision of key community facilities, including primary schools and community hubs, whilst delivering a scheme including well connected street patterns and walkable neighbourhoods.	+
CS 26 – Presumption in favour of sustainable development	Planning applications that accord with the policies in the Local Plan (and, where relevant, with polices in neighbourhood plans) will be approved without delay, unless material considerations indicate otherwise.	+

4.6.3 The Development has been appraised against the existing and emerging Development Plans and is consistent with all of the relevant policies contained within the emerging Core Strategy.

4.6.4 While the emerging Core Strategy is suspended for nine months from April 2014, the policy framework within it, in particular the long standing identification of an urban extension to the West of Loughborough at the Site, is considered to have significant weight. It is also founded upon robust evidence and sustainability appraisal work undertaken to support the allocation in the Plan.

4.6.5 Given that the Site is located within the Green Wedge area defined in the existing plan, it currently does conflict with Policy CT/3 of the existing Local Plan (2004) in this regard. Whilst this is a consideration, the emerging Core Strategy has considered this Green Wedge Policy in respect of West of Loughborough and found it is no longer relevant through the allocation of a Sustainable Urban Extension at this location. Therefore any proposals coming forward will be determined in the context of the weight given to the emerging Core Strategy policies and existing Development Plan, when read as a whole. The consistency of the proposals with the NPPF and PPG is also of material consideration, which it has been demonstrated that it is, as outlined above.

.

5 SOCIO ECONOMIC FACTORS

5.1 Introduction

5.1.1 This Chapter looks at the socio-economic factors and potential impacts of the Development on human well-being, and has assessed the likely implications on the following:

- Population;
- Employment;
- Housing;
- Community Facilities; and
- Education.

5.1.2 Whilst elements of the analysis may impact upon a wider area, the social and economic implications of the Development that have been assessed relate to Charnwood Borough.

5.2 Assessment Methodology and Significance Criteria

5.2.1 This Chapter sets out the current policy context and socio-economic profile of the Site and its context areas. The effects of the Development assessed later in this Chapter are appraised within the outlined socio-economic baseline context.

5.2.2 This Chapter follows the common methodology set out in the Introduction, comprising the following sections:

- **Study Area:** outlines the various context areas used in the assessment
- **Assessment Methodology**: provides an introduction to the nature of the assessment.
- **Existing Baseline Conditions**: this identifies and describes the current context of the area, based upon available socio-economic data at the local and national level. This includes elements in relation to various demographic, economic and social infrastructure indicators.
- **Assessment of Impacts, Mitigation and Residual Effects**: to assess the following key components where impacts are anticipated directly or indirectly, in relation to local economy, demographics, social infrastructure and contributions towards socio-economic policies and priorities. If necessary, appropriate mitigation measures to address any potential negative socio-economic impacts and the residual effects once appropriate mitigation measures have been implemented will also be considered.
- **Cumulative Impacts**: an assessment of the cumulative socio-economic impacts when other reasonably foreseeable or committed developments are considered.
- **Summary**: an overall assessment of the net socio-economic impacts of the Development.

5.3 Study Area

5.3.1 For the purposes of the demographic and economic assessment, the context area for Development has been defined as the Borough of Charnwood. The East Midlands and England profiles will be used as benchmarks for regional and national comparisons.

5.3.2 Social Infrastructure catchment areas are defined on the basis of individual demand, (for example; the catchment area used in determining existing supply of primary school places will be smaller than the catchment area used for determining the supply of secondary school places).

5.4 Assessment Methodology and Significance Criteria

5.4.1 This topic considers predicted potential effects of the Development on local communities and economic activity. The principal socio-economic effects resulting from the Development include:

- Potential demographic changes;
- Potential effects on labour markets;
- Potential effects on the housing market; and
- Potential effects on a range of community facilities including health, education and open space.

5.4.2 The ES then goes on to consider the existing baseline conditions by reviewing the Site and the surrounding area. This section assesses existing baseline conditions in relation to the following:

- Population and age structure;
- Economic activity and employment;
- Housing market conditions; and
- Provision of social infrastructure.

5.4.3 The current demographic and socio-economic situation of the Site has been reviewed focusing on national and local data, where the provision of community facilities and infrastructure has been evaluated. The study area assessed includes the area of West of Loughborough and the area surrounding the Site.

5.4.4 A number of policy documents, surveys and reports were analysed to determine the socio-economic impact of the Development:

- 2001 and 2011 Census Data;
- Neighbourhood Statistics data;
- NOMIS economic activity data;
- PACEC 2013 Leicester and Leicestershire Housing Market Area Employment Land Study;
- Charnwood Borough Council Housing Requirements Study;

- Edubase Department for Education Website;
- NHS Choices Website;
- UK Crime Statistics;
- Charnwood Borough Council Local Plan 2004;
- Charnwood Borough Council emerging Core Strategy; and
- Leicestershire Strategic Housing Market Assessment 2014.

5.4.5 The application is accompanied by a Statement of Community Involvement (SCI) which sets out the consultation exercises and engagement with the Local Planning Authority that has taken place to produce appropriate development proposals for the Site.

5.4.6 Through a Section 106 agreement contributions will be secured for public services, where they are necessary, reasonable, and related to the Development in accordance with Regulation 122 of the Community Infrastructure Levy Regulations 2010 (as amended).

5.5 Existing Baseline Conditions: Social Economic Conditions

Demographic and Household Characteristics

5.5.1 The population data summarised in Table 5.1 suggests that 166,100 people resided within the Borough of Charnwood in 2011. The data suggests that the population increased by approximately 8% between the 2001 and 2011 Census; slightly less than the increase for the East Midlands, but greater than the increase for England.

Table 5.1 Population Trends (Source: Census 2001 and Census 2011, ONS)

Area	Population 2001	Population 2011	% change between 2001 and 2011
Charnwood Borough	153,462	166,100	8.23%
East Midlands	4,172,174	4,533,222	8.65%
England	49,138,831	53,012,456	7.9%

5.5.2 The 2011 Census revealed that the age structures of the immediate context areas and that of the East Midlands and England were largely similar. In particular, whilst the overall working age population (using 15-64 as a proxy) was slightly greater in Charnwood Borough (67.7%) compared to regional and national figures (65.6% and 66% respectively).

5.5.3 There was greatest difference in the proportion of residents aged 15-19 and 20-24, with the former 7.7% (compared to 6.5% and 6.3% regionally and nationally) and the latter 9.7% (compared to 6.8% and 6.8% regionally and nationally).

5.5.4 These trends suggest that the population structure in the Borough of Charnwood is largely similar to the population structure in the East Midlands and England as a whole, however, with a slightly greater proportion of those aged 15-24.

Table 5.2 Age Structure (Source: Census 2011, ONS)

Age Bands	Charnwood Borough (%)	East Midlands (%)	England (%)
Age 0 to 4	5.5	6.0	6.3
Age 5 to 9	4.9	5.4	5.6
Age 10 to 14	5.4	5.8	5.8
Age 15 to 19	7.7	6.5	6.3
Age 20 to 24	9.7	6.8	6.8
Age 25 to 29	6.1	6.1	6.9
Age 30 to 44	18.8	19.8	20.6
Age 45 to 59	19.2	20.0	19.4
Age 60 to 64	6.2	6.4	6.0
Age 65 to 74	8.6	9.1	8.6
Age 75 to 84	5.6	5.7	5.5
Age 85 to 89	1.4	1.5	1.5
Age 90 and over	0.8	0.7	0.8
Total	**100**	**100**	**100**

5.5.5 The Census 2011 also allows the estimation of average household sizes in the immediate and wider context areas. Using a combination of household spaces and population data to calculate household size, the 2011 Census indicates that average household size in the immediate context area is typically higher than the regional and national average, as shown by the data in Table 5.3.

Table 5.3 Average Household Size (Source: Census 2011, ONS)

Area	Average Household Size
Charnwood Borough	2.50
East Midlands	2.39
England	2.40

5.5.6 The demographic and household characteristics data available in the 2011 Census suggests that the immediate context area is largely similar to regional and national level data in terms of broad trends, with a slightly greater proportion of the population of working age, and greater proportion of 15-24 year olds than regional and national trends.

Economic Activity and Unemployment

5.5.7 The Census provides details on economic activity and worklessness for the immediate and wider context areas. Economic activity rates reflect labour market participation for residents and are measured as a proportion of the working age population (using 16-64 as a proxy). The Census

2011 demonstrates that economic activity rates are slightly lower in Charnwood Borough relative to the East Midlands and England benchmarks, as shown in Table 5.4.

Table 5.4 Economic Activity Rates in 2001 and 2011 (Source: Census 2001, ONS; Census 2011, ONS)

Area	Economic Activity Rate 2001 (%)	Economic Activity Rate 2011 (%)
Charnwood Borough	63.7	63.4
East Midlands	64.6	66.1
England	64.3	66.5

5.5.8 When compared to 2001 economic activity rates, the data in Table 5.4 highlights a variance from regional and national trends within Charnwood Borough, where economic activity declined marginally, compared to increases regionally and nationally.

5.5.9 One of the factors contributing to the lower rates of economic activity within Charnwood Borough is likely to be the high proportion of full-time students, which is approximately twice the regional and national average, as shown by the data in Table 5.5.

Table 5.5 Economic Inactivity - Full Time Students % in 2011 (Source: Census 2011, ONS)

Area	Economic Inactivity- Full-Time Students (%)
Charnwood Borough	11.4
East Midlands	5.8
England	5.8

5.5.10 The 2011 Census also provides further details on unemployment. Table 5.6 shows that the unemployment rate, measured as a proportion of the working age economically active population, is lower in Charnwood Borough compared to across the East Midlands and England as a whole. In addition, the proportion of unemployed experiencing long term unemployment and the proportion of 16-24 year olds unemployed is lower in the context areas relative to these comparators.

Table 5.6 Unemployment Characteristics (Source: Census 2011, ONS)

Area	Unemployment Rate %	Youth Unemployment %	Long-term Unemployment %
Charnwood Borough	3.1	0.9	1.2
East Midlands	4.2	1.2	1.6
England	4.4	1.2	1.7

5.5.11 The unemployment findings are confirmed by trends in the claimant count rate. The claimant count rate illustrates the proportion of the working age population claiming Job Seekers Allowance (JSA). Figure 5.1 indicates that the rates for Charnwood Borough have been consistently below equivalent rates for the East Midlands and GB since 2006.

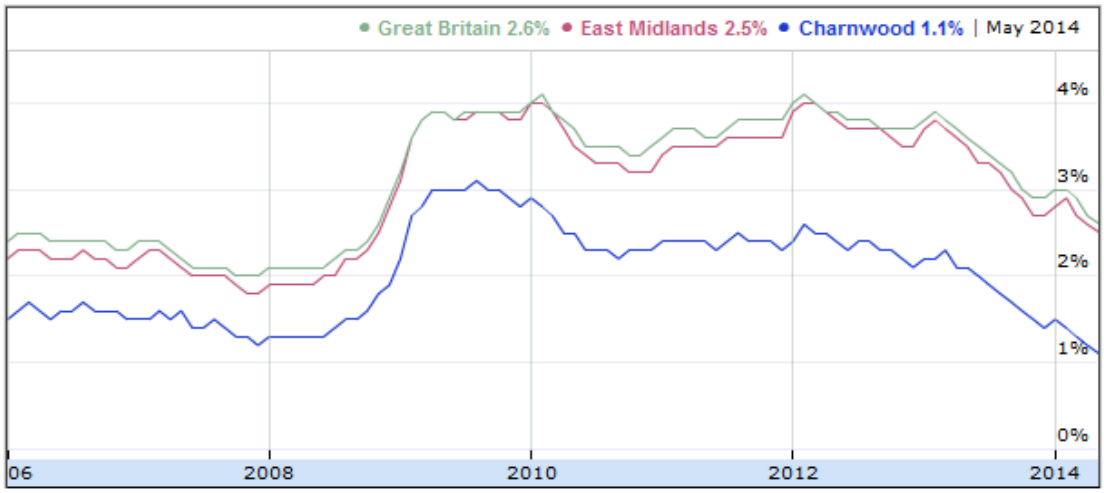

Figure 5.1 – Claimant Count Trends 2006-14 (Source: Claimant Count 2014, NOMIS)

5.5.12 Combined, the demographic and economic activity/unemployment data implies an above-average proportion of full-time students in the local area. This would explain the lower levels of economic activity, unemployment and JSA claimants compared to regional and national benchmarks.

Employment

5.5.13 Job Density data was provided in the 2011 Census. It is defined as the total number of jobs available as a proportion of resident population aged 16-64, therefore providing an indication of whether there is sufficient supply of employment opportunities in an area.

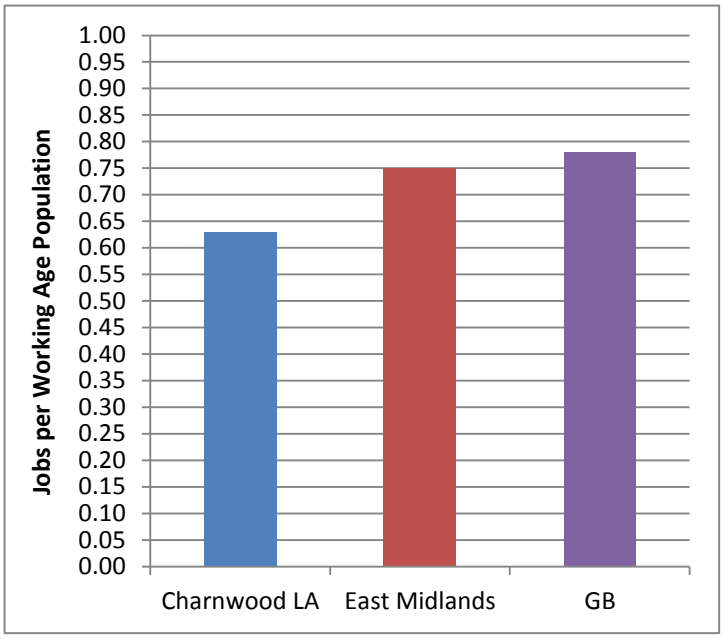

Figure 5.2 – Jobs Density (Source: ONS, 2011 NOMIS)

5.5.14 Figure 5.2 indicates that there is a deficiency in job opportunities in the Borough of Charnwood, with a lower proportion of jobs per working age population compared to regional and national comparators. Therefore, despite the higher jobs density ratio for the region, the data indicates that there is a shortage of employment opportunities in Charnwood Borough.

5.5.15 The sectoral profile for the Borough of Charnwood, in comparison to regional and national benchmarks, is outlined in Figure 5.3. The data indicates that higher sectors of employment (Sectors 1-3) are over-represented in the Borough of Charnwood relative to the proportion for the East Midlands as a whole, although the figures reflect national levels. Conversely, the skill sectors 7-9, are under-represented within the Borough, when compared to the proportion employed in these sectors within the East Midlands, although again reflecting national figures.

5.5.16 Together, these figures suggest a more skilled workforce within the immediate area, when compared to the wider region.

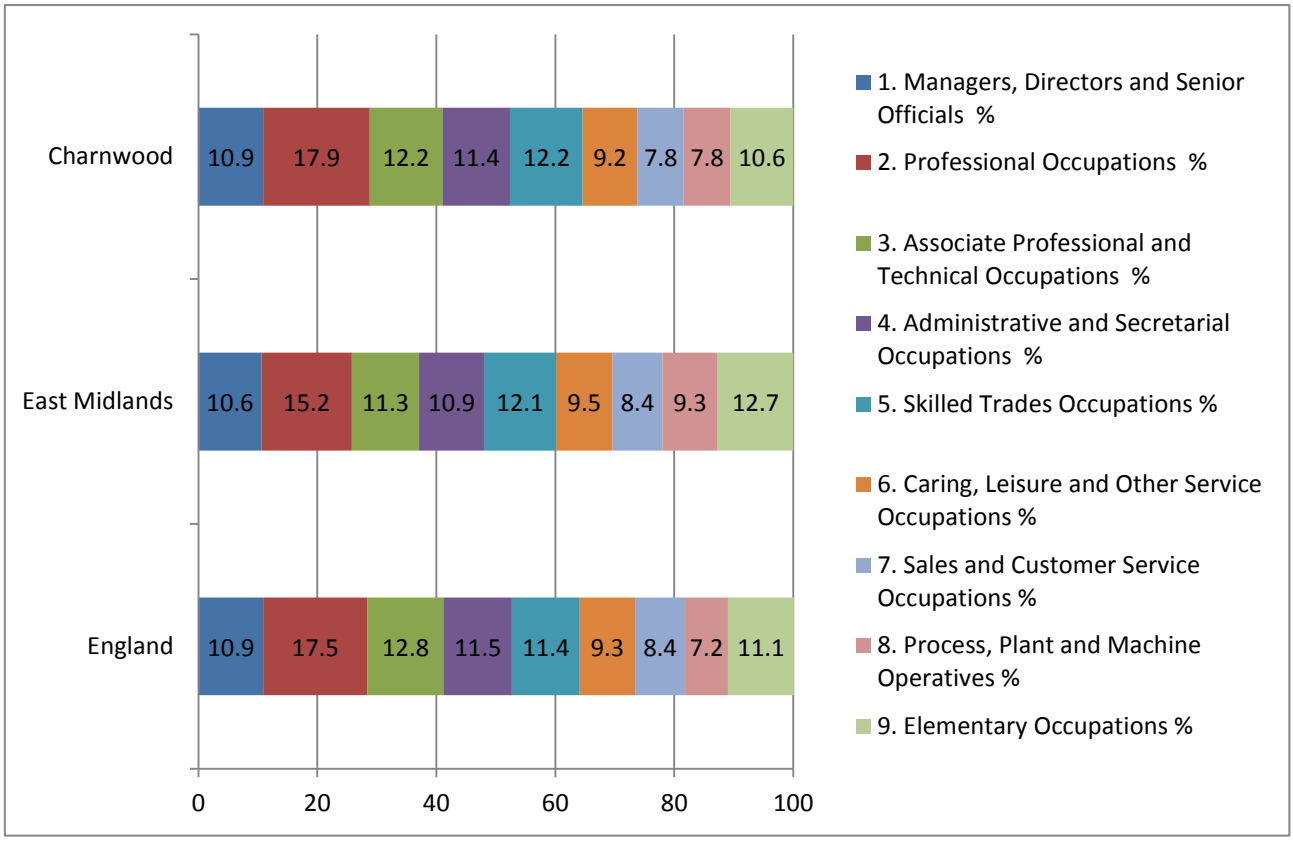

Figure 5.3 – Sectoral Profile of Employment (Source: BRES 2011, NOMIS)

5.5.17 Forecasts of employment for Charnwood and the wider Leicestershire Area are provided within the Leicester and Leicestershire Housing Market Area (HMA) Employment Land Study. This data, as reproduced in Table 5.7, highlights how within Charnwood Borough it is expected that 'B1 a/b Office' and 'Other' jobs will increase significantly between 2010 and 2031, whilst 'B1c/B2 Industrial' and 'B8 Warehousing' will decrease. These forecasts are similar for the Leicestershire Housing Market Area (HMA), with the exception of B8 Warehousing, which is expected to increase for the wider HMA.

Table 5.7 Total Workplace Jobs (Source: Leicester and Leicestershire HMA Employment Land Study, PACEC, 2013)

Sector	Charnwood		Leicestershire HMA	
	Jobs in 2010 (000s)	Jobs in 2031 (000s)	Jobs in 2010 (000s)	Jobs in 2031 (000s)
B1 a/b Office	12.2	20.0	78.7	108.4
B1c/B2 Industrial	11.3	7.4	83.5	58.3
B8 Warehousing	4.2	3.3	41.3	46.1
Other	43.2	57.1	280.9	333.5
Total	**71**	**87.9**	**484.4**	**546.3**

5.5.18 This increase in total jobs is also represented in Figure 5.4, which considers PACEC projections of job growth, while also considering past trend data from Experian and ONS.

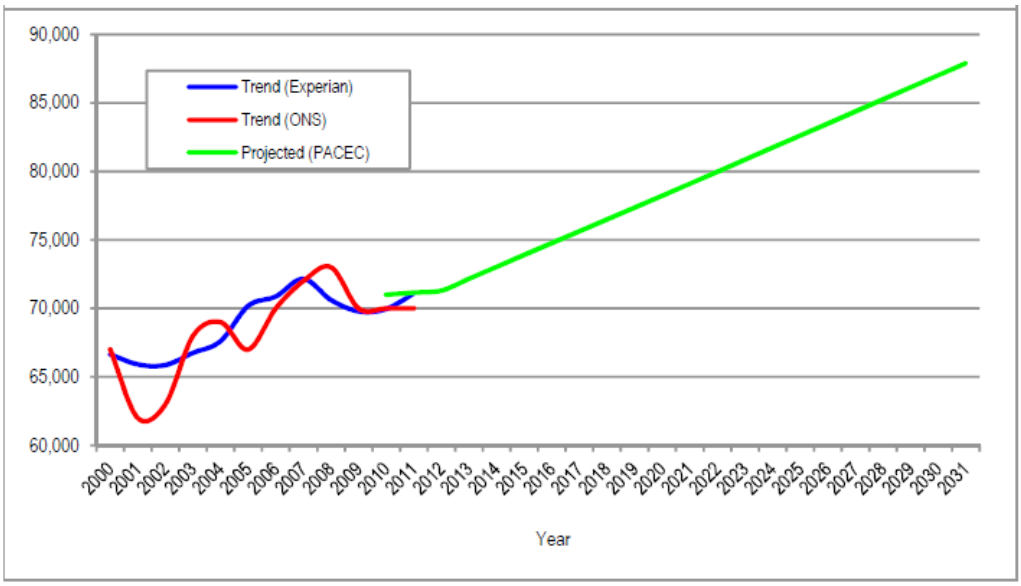

Figure 5.4 – Past and projected trends in job growth (Source: Charnwood Borough Council Housing Requirements Study, 2013)

Provision of Social Infrastructure

5.5.19 This section provides a succinct audit of the community infrastructure in the near vicinity of the Site. Community infrastructure has been defined as education (primary and secondary schools), health (GP Surgeries and Dental Surgeries) and public open space. This section of the report presents a brief synopsis of the key facilities and services available to support sustainable communities as a result of any housing development.

Education Provision

5.5.20 Data was obtained from the Department for Education's Edubase website. The website outlines the Department's register of educational establishments in England and Wales and provides details on school enrolment and capacity levels.

5.5.21 Edubase set out that there are nine primary schools within close proximity to the Site. The list of primary schools, their registered capacity, pupil enrolment and available capacity is presented in Table 5.8 below.

5.5.22 The Edubase statistics indicates there is available capacity at most of the primary schools serving West of Loughborough, resulting in a total available capacity of 355 pupil places. This reflects an overall surplus capacity of almost 17%. However, existing capacity does not allow for future projected capacity and therefore discussions have been held between the Consortium and the Local Education Authority in respect of the Development. It is considered that the Development will give rise to the need for two primary schools and these will be provided as part of the SUE.

Table 5.8 Primary Schools Serving West of Loughborough (Source: Edubase Department for Education, 2014)

Primary School	School's Registered Capacity	Number of Pupils Enrolled	Available Capacity
Booth Wood Primary School	210	190	20
Hathern C of E Primary School	105	100	5
Newcroft Primary School	360	215	145
Robert Bakewell Primary School	294	245	49
St. Botolphe's C of E Primary School	210	230	-20
Saint Winefride's Catholic Primary School	210	200	10
Stonebow Primary School	338	300	38
Thorpe Acre Infant School	135	115	20
Thorpe Acre Junior School	208	120	88

5.5.23 Edubase suggests that there are five secondary schools within close proximity to the Site. The list of secondary schools, their registered capacity, pupil enrolment and available capacity is presented in Table 5.9.

Table 5.9 Secondary Schools Serving West of Loughborough (Source: Edubase Department for Education, 2013)

Secondary School	School's Registered Capacity	Number of Pupils Enrolled	Available Capacity
Charnwood College (high)	810	375	435
Charnwood College (upper)	1462	815	647
De Lisle Catholic High School	1182	1310	-128
Hind Leys Community College	727	585	142
Shepshed High School	548	500	48

5.5.24 The Edubase statistics show that of the five secondary schools in the local area, most have available capacity, resulting in gross available capacity of 1,144 pupil places in the West of Loughborough. This reflects a surplus capacity of over 26.7%, reinforcing that there is no need to provide additional secondary school capacity within the Development.

Health Provision

5.5.25 Doctors' surgeries in the West of Loughborough area were identified using NHS Choices database. The analysis indicated that there were ten doctors' surgeries within one mile of the Site, with 52 GPs in total working there, as shown in Table 5.10. All surgeries are currently accepting new patients.

Table 5.10 Capacity at GPs in the West of Loughborough area (Source: NHS Choices, 2013)

GP Name	Number of GPs	Accepting New Patients
Cross Street Surgery	8	Yes
GS Patel	1	Yes
Field Street Surgery	1	Yes
Orchard Surgery	5	Yes
Maxwell Drive Surgery	7	Yes
Forest House Surgery	8	Yes
Dr JCW Jolleys & Partners	3	Yes
Forest Edge Medical Centre	4	Yes
Rosebery Medical Centre	10	Yes
Dr N N Vaghela & Partners	5	Yes

5.5.26 Dental surgeries in the West of Loughborough Area were also identified, which were located close to the proposed SUE. NHS Choices identified ten dental surgeries in the local area, the

majority of which were accepting new fee-paying, charge-exempt and child patients. This highlights that new residents would have a choice of dental services available to them.

Table 5.11 Capacity at dental surgeries near to the West of Loughborough (Source: NHS Choices, 2013)

Dental Surgery	Accepting New Patients?		
	Fee-paying adults?	Charge exempt adults?	Children?
Charnwood Dental Centre	Yes	Yes	Yes
Shepshed Dental Practice	Yes	Yes	Yes
Gorse Covert Dental Practice	Yes	Yes	Yes
Sherwood House Dental Practice	No	No	No
Loughborough University Dental Practice	Yes	Yes	Yes
Yoursmile Dental Care	Yes	Yes	Yes
Dentoral Dental Practice	Yes	Yes	Yes
SS Attwall/ KK Attwall	Yes	Yes	Yes
Granby House Dental Practice	No	No	Yes
Carillon Dental Care	Yes	Yes	Yes

Public Open Space

5.5.27 Charnwood Borough Council Local Plan (2004) aimed to ensure that all new housing developments make provision for well-designed and located play spaces.

5.5.28 The standards required by the adopted Local Plan for different types of open space are detailed in Table 5.12.

Table 5.12 Adopted Local Plan Open Space Requirements (Source: Charnwood Borough Council Local Plan, 2004)

Typology	Quantity to be provided per 10 dwellings	Other considerations
Children's equipped playgrounds	75 sqm	Within 400m of all properties
Other children's play spaces	125 sqm	Within 200m of all properties
Youth/adult recreational facilities	425 sqm	
Landscaped areas of amenity open space	38 sqm	

5.5.29 The emerging Core Strategy updates the above requirements, providing further information on the open space provision expected within new developments, through Draft Policy CS15. These requirements are detailed in Table 5.13.

Table 5.13 Emerging Core Strategy Open Space Requirements (Source: Charnwood Borough Council Core Strategy, 2013)

Typology	Quantity to be provided	Minimum Site Size
Parks	0.32 hectares per 1000 population	0.4 hectares
Natural and Semi Natural Open Space	2 hectares per 1000 population	0.05 hectares
Amenity Green Space	0.46 hectares per 1000 population	0.1 hectares
Facilities for Children	Within 480m of each home	0.04 hectares
Facilities for Young People	Within 480m of each home	0.04 hectares
Outdoor Sports Facilities	2.6 hectares per 1000 population	0.28 hectares
Allotments	0.33 hectares per 1000 population	0.05 hectares
Indoor Sport	To be calculated using the Sport England Facility Calculator	

5.5.30 Within policy CS22 of the emerging Core Strategy, Charnwood Borough Council also sets guidance for the delivery of open space specific to the SUE at West of Loughborough. This is detailed in Table 5.14.

Table 5.14 - Open Space Standards in Charnwood (Source: Charnwood Borough Council Core Strategy, 2013)

Typology	Core Strategy Policy CS22
Parks	1.5ha
Amenity Green Space	3.4ha
Facilities for Children	14 sites
Facilities for Young People	14 sites
Outdoor sports Facilities	22.8 ha for outdoor sports- including 9 hectares of playing pitches and around 4 tennis courts
Indoor Courts	3
Allotments	2.5ha

5.5.31 The Council has also prepared an Open Space and Recreation Study that identified the need for a range of typologies of open space and recreation alongside deficiencies in provision. This identified that where parks are expected more locally there are some gaps in the existing network of provision, particularly in South Loughborough and South Shepshed. The study also identified there are also residents with limited access to natural open space, in particular in Shepshed and pressures for allotments in Loughborough.

Crime

5.5.32 UK Crime Stats provide up to date crime information for Garendon Ward as well as Loughborough a whole.

5.5.33 The data shows that Garendon Ward currently experiences lower rates of crime than Loughborough, when crime statistics are compared by crimes per 1,000 people, as shown in figure 5.5.

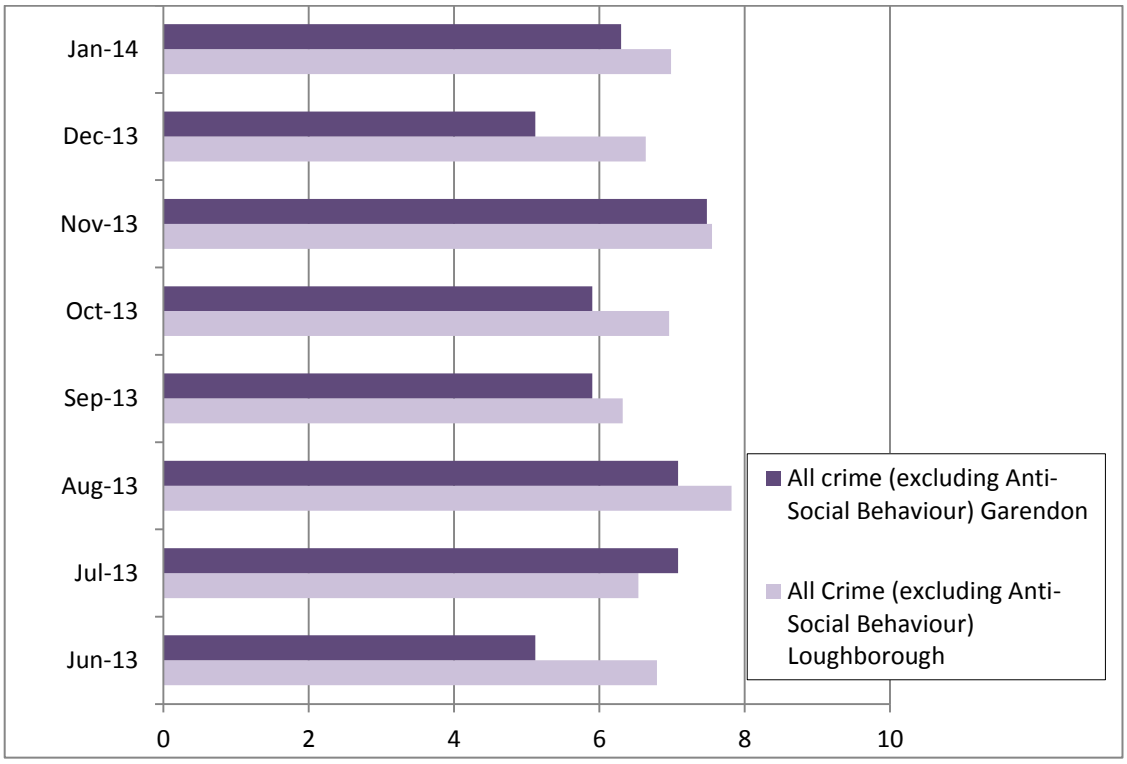

Figure 5.5 All crimes (excluding Anti-Social Behaviour) by month per 1000 population

5.5.34 When considering specific types of crime such as vehicle crime and burglary, Garendon Ward continues to perform favourably, with fewer crimes per 1,000 population according to data from UK Crime Stats. When considering robbery offences specifically, just one offence was recorded in the past eight months in Garendon Ward. This highlights the positive nature of existing conditions relating to crime in Garendon Ward.

5.6 Housing Market Conditions

5.6.1 The 2011 Census and the Council's 2013 Annual Monitoring Report provide up-to-date estimates for housing stock in the Borough of Charnwood. Based on the Dwelling Stock by Council Tax Band data recorded in the 2001 and 2011 Census, housing stock in the Borough increased by

approximately 10.9%, greater than the housing stock increase recorded for the East Midlands, which was 9.61%.

5.6.2 Data from Communities and Local Government record the annual total dwelling stock for Charnwood and the East Midlands, which has been used to show the variation in increase, reproduced in Figure 5.6.

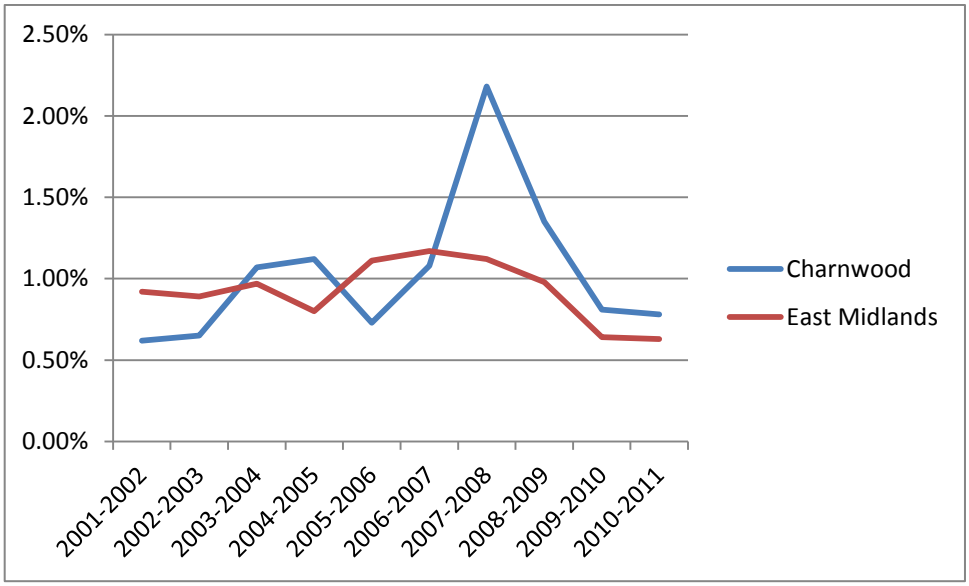

Figure 5.6 Dwelling Stock by Council Tax Band (Source: Communities and Local Government, Neighbourhood Statistics)

5.6.3 While there was a consistent increase in dwelling stock at both regional and local levels, the annual level of increase varies more widely for Charnwood, with increases clearly peaking in 2007-2008, at more than three times the level of increase in 2001-2002, with 1,424 dwellings completed, compared to 387.

5.6.4 The 2013 Annual Monitoring Report projects future completions for the period of the existing Local Plan, with completions expected to increase between 2013-2014 and 2019-2020, compensating for the dip in completions when compared to annual requirement between 2009 and 2013, as shown in figure 5.7.

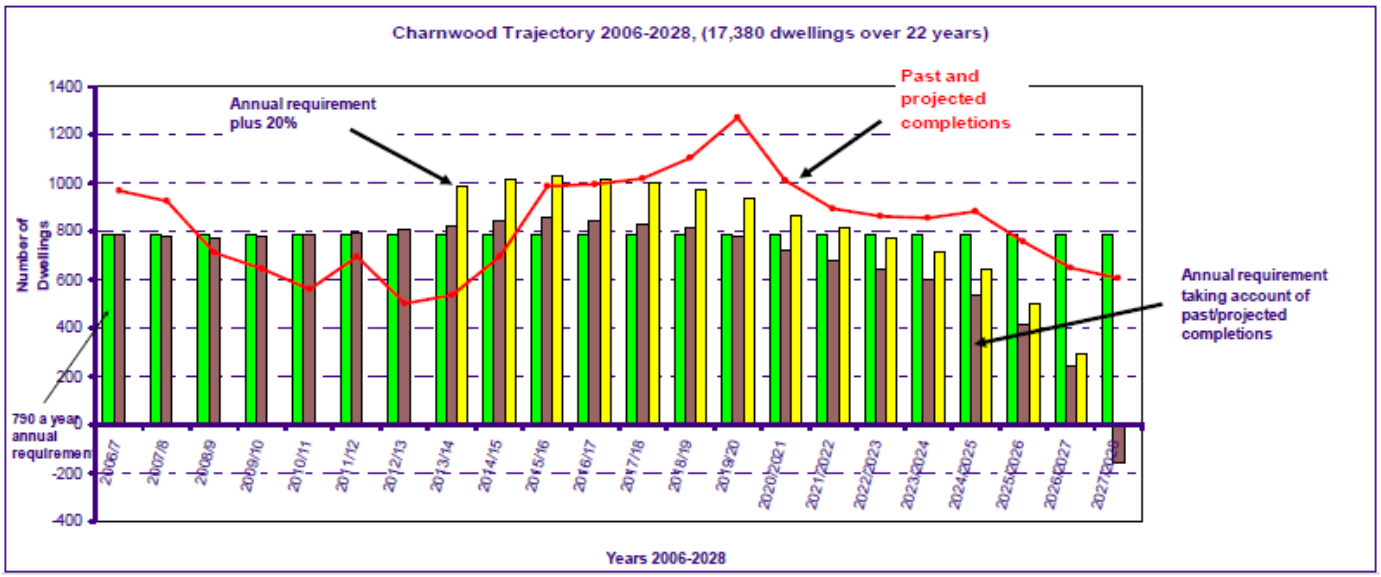

Figure 5.7 Charnwood Housing Trajectory (Source: Charnwood Borough Council Annual Monitoring Report, 2013)

5.6.5 Housing stock, when differentiated by Council Tax Band, as shown in Table 5.15, varies from regional and national figures. The 2011 Census data appears to show an under-representation of properties in Bands A-C, with 70% of properties falling into these bands, compared to 78% for the East Midlands, although the figure for England is significantly lower at 66%. Within these bands, as shown by the data in Table 5.15, Charnwood has a significantly smaller proportion of Band A properties, with Bands B and C occupying a significantly greater proportion of properties in the Borough, when compared to national and regional figures. This suggests that Charnwood has a lack of low value, smaller housing units, compared to regional and national figures.

5.6.6 When compared to national and regional figures, the proportions for Bands D-F also vary, as the figure for Charnwood at 26.3%, is slightly less than the national figure of 29.7%, both of which are significantly greater than the proportion for the East Midlands of 20%.These figures suggest that there is an over-representation of higher value, larger family dwellings in Charnwood, compared to the East Midlands, although the proportions are similar to England as a whole.

Table 5.15 Dwelling Stock by Council Tax Band (Source: Census 2011, Neighbourhood Statistics)

Council Tax Band	Charnwood	East Midlands	England
Band A	17.5%	37.7%	25.0%
Band B	28.2%	22.5%	19.6%
Band C	25.1%	18.0%	21.8%
Band D	13.7%	10.7%	15.3%
Band E	8.5%	6.3%	9.4%
Band F	4.1%	3.0%	5.0%
Band G	2.6%	1.7%	3.5%
Band H	0.3%	0.2%	0.6%
Band I	0%	0%	0%
Band X	0%	0%	0%
Totals	**100%**	**100%**	**100%**

Future Housing Requirements

5.6.7 The 2013 Charnwood Borough Council Housing Requirements Study provided a review of housing requirements from 2011-2031.

5.6.8 Three projections of housing requirements are provided, with the first based on demographic trends, suggesting a requirement for 15,800 additional homes between 2011 and 2031. The other two projections are based on the predictions for an increase in jobs, with 16,800 houses expected to be required assuming there is no change in commuting patterns, whereas 14,200 additional homes are expected to be required if there is a decrease in out-commuting.

5.6.9 The Study concluded that it is expected that there will be a significant increase in population and households, as well an increase in jobs with a slight decrease in net out-commuting. Therefore, a housing requirement to provide 790 additional homes per annum from 2011 onwards is set out in

the 2013 Housing Requirements Study as an objectively assessed level of housing need for the Borough of Charnwood.

5.6.10 While the Council has set out that an annual requirement of 790 dwellings per annum represents its objectively assessed need for housing, the Inspector examining the Charnwood Local Plan Core Strategy has recommended that the Examination be suspended for nine months to enable further work on the needs of the Borough and Housing Market Area (HMA) to be explored in more detail.

5.6.11 Following the advice of the Inspector, the Council and its partner HMA authorities undertook a Strategic Housing Market Assessment (SHMA) for Leicestershire. This identified an objectively assessed annual need for housing in Charnwood of between 810 and 820 dwellings per annum. While the future level of housing for Charnwood is yet to be determined through examination of the Council's Local Plan, the minimum requirement is 810-820 dwellings per annum.

Affordable Housing

5.6.12 Notwithstanding the current Core Strategy Examination position, the most recent 2014 SHMA includes an assessment of affordable housing need, which estimates a current housing need in 2013 of 739 households, excluding existing social housing tenants, where they would release a home for another household in need. The housing need model suggested that each year an estimated 749 households are expected to fall into housing need, whilst 632 properties are expected to come up for re-let.

5.6.13 Overall in the period 2013-2028, a net deficit of 2,484 affordable homes is identified, which suggests a requirement for 166 dwellings per annum. Therefore, the Council is seeking to secure additional affordable housing through new development.

5.6.14 While the new 2014 Leicestershire SHMA covers the entire Leicestershire HMA, it is less detailed on sub-HMA areas and Charnwood Borough. Therefore reference is made below to the Charnwood Housing Requirements Study (2013) for this evidence.

5.6.15 Charnwood Housing Requirements Study (October 2013) assessed the affordability of housing across the Borough by looking at household's ability to afford either home ownership or private rented housing (whichever is cheaper) without financial support. It demonstrates that 39% of households in the Borough are unable to access market housing on the basis of income levels. There is relatively little difference between the sub-areas although it is clear that affordability is slightly worse in Loughborough.

Table 5.16 Estimated Proportion of Households unable to afford Market Housing without Subsidy (Charnwood Housing Requirements Study, 2013)

Area	Households unable to afford	Estimated households	Percentage of households unable to afford
Loughborough	10,159	23,489	43.2%
Shepshed	1,887	5,870	32.1%
Leicester Fringe	7,772	19,853	39.2%
Rural	2,337	6,447	36.2%
Mountsorrel & Surrounds	3,974	11,706	34.0%
Charnwood Borough	26,130	67,365	38.8%

Mix of Housing

5.6.16 The Charnwood Housing Requirements Study (2013) also considers the level of households living in unsuitable housing. It identifies that 1.9% of all households in the Borough are living in unsuitable accommodation. Table 5.17 indicates that there is a similar level of households living in unsuitable accommodation across the Borough except for Loughborough where it is notably higher.

Table 5.17 Estimated Proportion of Households in Unsuitable Housing (Charnwood Housing Requirements Study, 2013)

Area	Households in unsuitable housing	Estimated households	Percentage of households in unsuitable housing
Loughborough	559	23,489	2.4%
Shepshed	97	5,870	1.6%
Leicester Fringe	349	19,853	1.8%
Rural	88	6,447	1.4%
Mountsorrel & Surrounds	196	11,706	1.7%
Charnwood Borough	1,289	67,365	1.9%

5.6.17 The Charnwood Housing Requirements Study (2013) includes the analysis of a housing market model, which takes into account how households of different ages occupy dwellings of different sizes. It suggests that market demand in Charnwood Borough is likely to be focused towards 2 and 3 bedroom properties, as shown by the data in Table 5.18.

5.6.18 For affordable housing similarly, the modelling suggests a significant proportion will require 2 and 3 bedroom properties, along with a relatively high requirement for one-bedroom accommodation.

Table 5.18 Housing Mix required by Unit Size Across Tenures (2011-2031) (Source: Charnwood Housing Requirements Study, 2013)

	1 Bedroom	2 Bedroom	3 Bedroom	4+ Bedroom
Market	5-10%	30-35%	40-45%	15-20%
Affordable	30-35%	40-45%	15-20%	5-10%
All	15%	35%	35%	15%

5.7 Assessment of Impacts, mitigation and Residual Effects

Business & Employment Effects

Construction Phase Employment Effects

5.7.1 One of the core effects during the construction phase of the Development is the creation of development-related employment. Given the scope of the proposals, the Development will lead to the creation of significant new full-time and part-time construction jobs.

5.7.2 Evidence provided by the Home Builders Federation identifies that there are approximately 1.5 jobs per dwellings directly involved with home building with another 0.9 within the supply chain. This sets out a total of 2.4 jobs per dwelling in the construction and supply chain industry.

Table 5.19 Construction Effects: New Jobs Created

Construction related impact	Jobs generated
Direct Construction Jobs	4,800 jobs
Supply chain jobs	2,880 jobs
Total Jobs	**7,680 jobs**

Operational Phase Employment Effects

5.7.3 The Development will result in provision of new employment comprising 16 hectares of industrial, warehousing and office units. The floorspace provided at the new industrial estate has the capacity to accommodate 1,360 gross FTE jobs as set out in table 5.20 below. In addition to this,

is employment generated through the community facility components of the application. This includes the provision of two primary schools and a Community Hub.

5.7.4 Furthermore, the operational component of Garendon Park through the management of the Park and the buildings, plus the opportunities created through the reuse of buildings will further increase the employment contributions from the Development.

5.7.5 These impacts of the new employment areas are summarised in the table below.

Table 5.20 Employment Effects: New Industrial Estate

Land Use	Gross Floorspace	Jobs[1 2]
Industrial/Warehousing Units	56,100 sqm	860 FTE
General Offices	6,000 sqm	400 FTE
Community Hub / Local Retail	2,350 sqm	100 FTE
Total New Jobs Created		**1,360 FTE**

5.8 Population

Demographic Effects

5.8.1 The Application Site supports proposals for up to 3,200 new residential units which are envisaged to be delivered by 2028.

5.8.2 The immediate effects of new people moving into the Borough, or relocating from elsewhere within Loughborough or Charnwood, will cause some impact due to increased patronage at local facilities. However, this is considered to be short term as the proposals include the provision of new facilities including two new primary schools, a Community Hub and recreational areas. Additional extra patronage can help to sustain existing facilities.

5.8.3 There will be an effect during the construction period resulting from an increase in patronage at local retail facilities and service facilities including overnight accommodation. The duration of this construction period is a matter to be determined. However, it is likely to be approximately 14 years, although new local facilities within the Development will be provided during this period in accordance with phasing arrangements to be agreed.

[1] Using the Homes and Communities Agency 'Employment Density Guide' 2nd Edition, 2010

[2] Using 20% Gross Internal to Net Internal Calculator

5.8.4 The effects during the operational stage of the Development relate directly to the potential population profile of the Development. This can be estimated using typical household size statistics to broadly translate dwellings into population. The 2011 Interim Household Projections provide data on household size from the most recent Census evidence. However, it is acknowledged in a number of studies, including the Council's Housing Requirements Study and the Leicestershire SHMA (2014) that the interim 2011 household size figures may have been supressed with recent economic and housing trends. This is particularly the case if the previous evidence in the 2008-based Sub-National Household Projections are examined for household size, as these are considered to be less constrained.

5.8.5 The Housing Requirement Study for Charnwood (2013) and the 2014 Leicestershire SHMA suggest that it's appropriate to establish a mid-point between the 2008 and 2011 Household Projections to identify an average likely household size. This results in a household size reducing from 2.49 in 2011 to 2.43 in 2031.

5.8.6 For the purpose of establishing a population likely to be resident in the Development in 2031 a household size of 2.43 has therefore been used. This suggests that there will be a resident population of approximately 7,800 people from 3,200 dwellings in 2028.

5.8.7 In terms of defining this population, there are a number of ways that this can be undertaken. For the purposes of this ES, the proportional population breakdown from the Council's 2014 SHMA has been applied to the population expected to be resident in the development. This is estimated in Table 5.21.

Table 5.21 Expected Population

Age	Percentage	Numbers
0-14	15%	1,170
15-29	24%	1,872
30-44	17%	1,326
45-59	16%	1,248
60-74	16%	1,248
75+	12%	936
TOTAL	**100%**	**7,800**

Housing

5.8.8 In relation to the provision of additional homes, whilst the precise housing mix will be determined through reserved matters, it will include a range of dwelling types and tenures. By comparison to the existing housing market conditions and general dwelling numbers (69,200) in Charnwood Borough, the impact on overall mix of types will be marginal at less than 5%. However, with the additional housing proposed in the Borough the total housing stock is expected to be 86,600 in 2028 and therefore the SUE will account for only 3.7% of the housing stock.

5.8.9 The provision of up to 3,200 new dwellings as an urban extension will make an important contribution to the Borough and will widen the availability of affordable homes in the immediate area and contribute to the Borough Council's target of 30% of all new homes being affordable homes.

5.8.10 In terms of mix and type, this will be determined through reserved matters applications, however, the Site is considered particularly suited to providing a full range of housing and densities. The Development will also provide a new destination for the housing market and enable home buyers to move up the property ladder into larger properties, as well as smaller homes for newly formed households and for those that are looking to potentially downsize. The residential component of the Development will also provide a proportion of starter homes and affordable housing that will ensure that both low cost rental accommodation and shared equity opportunities are available and provided within this part of Charnwood Borough.

Appropriateness of Health Infrastructure

5.8.11 In relation to health facilities, the largest effect is likely to be on General Practitioners in the area. As set out earlier, the population of the Development is expected to be circa 7,800 people.

5.8.12 The above analysis of current health provision has identified 10 GP surgeries in close proximity to the Site, all of which are accepting new patients. In discussions with Leicestershire County Council, it has been confirmed that there is no requirement for the inclusion of a new GP surgery within the Development, although financial contributions towards primary healthcare off-site will be provided. This will be negotiated through the S106 procedure.

5.8.13 The Consortium will also provide a Community Hub, and while at present there is no identified need for a new GP surgery within this, the potential for this to accommodate such a use in future is entirely within the scope of the facility proposed.

Appropriateness of Education Infrastructure

5.8.14 In relation to education requirements, there will clearly be an effect on local schools. Discussions have been held with Leicestershire County Council and it is estimated that the full development of 3,200 dwellings will generate the need for 3.5 form entry school provision. It is proposed that this is provided through 2 primary schools, one being 1.5 form entry and the other being a 2 form entry school.

5.8.15 In respect of other secondary education provision the Local Education Authority has confirmed that there is no requirement for a financial contribution towards this or inclusion of a secondary school on Site. This is due to suitable capacity within existing schools adjoining and adjacent to the Site. This can be observed from the evidence set out earlier.

Appropriateness of Public Open Space Infrastructure

5.8.16 As outlined in the baseline section, Charnwood Borough Council is seeking contributions for open space as set out in Draft Policy CS15 (including natural and semi-natural open space) per 1,000 residents in the Local Authority area. However, it should be noted that these standards have no policy status at present and reflect an evidence base prepared prior to the Core Strategy.

5.8.17 In the context of Draft Policy CS15, Draft Policy CS22 which proposes to allocate the West of Loughborough SUE specifically requires around 22.8ha of outdoor recreation provision. This

includes 9ha of playing pitches. The Development will provide 9 ha of formal sports provision. The remaining outdoor provision (13.8ha) is proposed to be provided in a number of locations across the Development, including within the north-east of Garendon Park. Provision within Garendon Park will be unmarked, but provided as recreational areas so as not to detrimentally affect the historic setting of the Park.

5.8.18 The Development includes the provision of on-site public open space provision to enable future residents to exercise locally. The Green Infrastructure (GI) proposed is extensive and will provide appropriate facilities to ensure that there would not be a significant impact on existing local facilities within Loughborough. The Council has identified open space, sport and recreational requirements within the emerging Core Strategy for the SUE and these are exceeded by the proposals.

5.8.19 In addition there is a substantial amount of open space and recreational area provided in association with the restoration and enhancement of Garendon Park. This will have open public access whereas at present no public access is available.

5.8.20 In terms of provision against the requirements of Draft Policy CS22, the SUE will include a significant amount of sports and recreation/play provision and, in addition to this, public open space will be provided as below:

- 3.5 ha at Hathern Hill Community Park will include children's play facilities;
- 1.5 ha at Red Arch Park will include children's play facilities;
- 3 ha other pocket parks by residential areas;
- 9 ha of informal open space along the Black Brook corridor and at Garendon Common;
- An open space buffer to Bunker Hill and the pylons of 4ha;
- 20.5 ha informal open space to the north and south of Garendon Common;
- 3.5 ha existing open space east of Stonebow Walk/Baileys Plantation will be retained; and
- 2.5 ha of allotments in two locations.

5.8.21 In respect of wider GI, woodland planting is also proposed within the Development.

5.8.22 These open space proposals very substantially exceed the Council's policy requirements of 3.4ha amenity space and 1.5ha of parks to be provided. It also provides for improved parks, allotments and areas of natural and semi-natural open space which have been identified as areas with deficiencies in the Council's Open Space and Recreation Study.

5.9 Wider Socio-Economic Effects

5.9.1 The Development is strategically aligned with the national and local policy context. It is an important opportunity for private sector investment in the area during the recovering economic climate. The Development will particularly benefit the economy of the Charnwood Borough as a whole. Furthermore, considering the current over-representation of public sector employment in

the wider context area and the on-going contraction of the public sector across the UK, the area's economy may face a further decline in job numbers if schemes like the application proposals, which create mechanisms for private sector based job creation, are not supported. On a similar note, as identified in the policy review, Charnwood Borough is in need of investment in newer, better quality employment floorspace to support its economic aspirations. The Development will make a significant contribution towards these economic priorities.

5.9.2 The Government has proposed to boost the economic recovery by decentralising many services and empowering local communities to create their own entrepreneurial local economies with support from the private sector. The promotion of balanced growth shared across the country aims to encourage areas such as Charnwood Borough to improve its economic performance, growth and housing provision. The high quality mixed-use proposals for the Site will not only contribute towards the local aspirations set out in the Core Strategy, but also national policy documents such as the NPPF and PPG. In particular, these policy documents seek to create sustainable places where people want to live and work, and where businesses want to invest.

5.9.3 The Development will also contribute to the new Local Growth White Paper, not least by ensuring private sector investment in excess of £72 million and job creation in key target sectors (e.g. construction and retail, as identified in 'The path to strong, sustainable and balanced growth') in a difficult economic climate.

5.9.4 The Development will make significant contributions towards improving the area's housing supply, which has under-performed recently. The proposals will also ignite private sector investor confidence in the area, a key driver for creating conditions for economic growth and therefore delivery of new employment sites. Furthermore, the housing proposals for the Site, which include family homes, affordable homes (subject to results of financial viability assessment) and accommodation for the elderly, will make significant contribution to the supply of housing in Loughborough and the HMA as a whole.

5.10 Significance of Construction and Operational Effects

5.10.1 The significance of predicted effects is indicated in the table below.

Table 5.22 Significance of Predicted Effects

Receptor	Receptor Value	Sensitivity and Magnitude	Beneficial/ Neutral/ Adverse	Significance
Construction Employment	Beneficial (new construction jobs created)	Significant magnitude – 4,800 new construction related jobs created and 2,880 supply chain jobs. Medium sensitivity – construction employment is often sourced from a wider catchment than the immediate context area.	Beneficial	Significant effect

Receptor	Receptor Value	Sensitivity and Magnitude	Beneficial/ Neutral/ Adverse	Significance
Operational Employment	Beneficial (new jobs created and existing jobs safeguarded)	Major magnitude - around 1,360 gross FTE jobs created High sensitivity – given the economic recovery taking place.	Beneficial	Major significant effect
Housing Provision	Beneficial (new units proposed as part of the housing development)	Major magnitude – 3,200 new units delivered. High sensitivity – considering recent trends in housing provision in the area.	Beneficial	Major significant effect
Demographic Impacts	Beneficial (new population in the area)	Major magnitude -7,800 gross new residents. High sensitivity – new population will increase consumer expenditure in Loughborough.	Beneficial	Major significant effect
Social Infrastructure Impacts	Beneficial (proposals will not put any pressures on the existing social infrastructure – education, health and open space)	Major magnitude – over 22.8ha of outdoor recreational space provided plus the restoration of Garendon Historic Park. – Medium sensitivity – infrastructure providers within the local area can absorb some impacts	Beneficial	Major significant effect (considering sufficient capacity at schools and health facilities in proximity to the Site. High quality open space will also be provided.
Wider Socio-Economic Benefits	Beneficial	Major magnitude – the proposals align with local and national policy imperatives. High sensitivity – will enhance Loughborough as a place where people will want to live, work and visit, and where businesses will want to invest.	Beneficial	Major significant effect.

5.11 Cumulative and Residual Effects

Cumulative Effects

5.11.1 Based on the emerging Core Strategy, the proposal for up to 3,200 dwellings, 16 ha of employment, a Community Hub for community uses and associated landscaping and green infrastructure will cumulatively have significant positive effects on Loughborough Town and Charnwood Borough as a whole.

5.11.2 The delivery of up to 3,200 residential units could support a population of 7,800 residents. This estimate is based on application of the average household size projections of 2.43 persons per household. It is difficult to infer whether the residents in these new dwellings will all be additional

population for the area. Nevertheless, a potential increase in population of this magnitude could apply significant pressure to social infrastructure provision, (most notably education, health and open space).

5.11.3 A cumulative population yield of 7,800 people could significantly increase demand for healthcare provision, in particular GP and dental facilities. However, it should be noted that health care providers have set out that an overall impact of up to 2,800 new patients would be acceptable in Loughborough.

5.11.4 In terms of open space provision, the cumulative population yield of 7,800 residents could result in significant increased demand for access and availability of open space. That said, in addition to the open space provision proposed as part of this application (which will exceed the overall local authority quantity standards), significant new open space and recreational provision will be provided through the restoration of Garendon Park.

5.11.5 It is acknowledged that due to the increasing population in the area, the numbers of crimes recorded will be expected to increase. However, it is not expected that high levels of crime will be recorded, as any increase will be proportionate to the increase in population, and existing levels of crime in Garendon ward are lower than Loughborough as a whole and so it is expected that crime is unlikely to exceed reasonable levels. Effective design of the SUE will also help to prevent increase in crime within the Development and local area

5.11.6 The cumulative effects of up to 3,200 new dwellings will provide new consumer expenditure for Loughborough and help assist in the retention of existing consumer expenditure in the Town. Furthermore, the Community Hub will also provide job opportunities to the increased labour force generated by the new dwellings.

5.11.7 Similarly, the provision of 16ha of employment land will provide opportunities for employment to existing and new residents in Loughborough and Charnwood as a whole.

5.11.8 Within this context, the cumulative effects of the proposal will see significant positive socio-economic effects for the Borough as a whole and more significantly for Loughborough Town, particularly linked to the wider strategic housing and economic growth plans for the Borough.

5.11.9 In respect of wider strategic growth of the Borough and around Loughborough and Shepshed, the Council has identified further growth locations to Shepshed and at the Loughborough University Science and Enterprise Park. Both of these locations will cumulatively with the Development increase the socio-economic effects of development on Loughborough and Charnwood Borough as a whole.

5.11.10 Additional residential development at Loughborough Town and that specifically at Shepshed, as set out in the Core Strategy will, with the Development cumulatively increase the positive socio economic effects for Charnwood in respect of meeting the identified need for new homes and providing for much needed affordable housing. The cumulative infrastructure requirements associated with this growth has been appraised within the Council's Core Strategy process and provision identified within each of the development policies contained within the Development Plan to manage this. The Development, is seeking to meet its identified infrastructure needs in close liaison with key stakeholders and infrastructure providers. In this context, it is not considered that negative cumulative effects will arise as a result of the development.

5.11.11 In respect of wider proposals, including the University Science and Enterprise Park proposals in the Core Strategy, the cumulative social economic impacts associated with this will be linked to additional job creation and economic prosperity. This will lead to significant positive effects. In respect to infrastructure effects, again similarly to residential proposals, the infrastructure requirements associated with the University Science and Enterprise Park proposals have been considered within the Council's Core Strategy infrastructure provisions contained within the policy allocation for the proposal to accommodate the development. As such there no negative effects associated with the Development and the University Science and Enterprise Park are identified.

Residual Effects

5.11.12 Following the implementation of appropriate mitigation measures it is not envisaged that residual impacts will be significant, and will be limited to the delivery of extended public services and on-site open space and affordable housing provision with beneficial effects economically and socially.

5.11.13 The retail element of the proposal is of a local scale which would have no significant effects on the viability of existing centres or Loughborough Town Centre.

5.12 Conclusion

5.12.1 Overall, the Development will result in significant positive socio-economic impacts across various receptors for both Loughborough and the wider Charnwood Borough area, without putting excessive additional pressures on the local social infrastructure.

5.12.2 In particular, the Development will result in creation of up to 3,200 high quality homes (including affordable housing) contributing towards Charnwood's housing targets. Additionally, the proposals will improve the wider context area's housing stock, which has underperformed recently.

5.12.3 Equally important are the conditions which the Development will generate, by creating new high quality employment premises, safeguarding existing jobs and creating new jobs for the local economy.

5.12.4 During the operational phase, the Development will result in creation of 1,360 FTE jobs. During the construction phase, 4,800 direct construction related jobs are estimated directly within the construction industry, a priority sector identified at national policy level, with an additional 2,880 jobs generated within the supply sector.

5.12.5 Whilst making positive contributions outlined above, the Development will not put any pressures on the existing social infrastructure, particularly in terms of education, health and open space. Rather, the Development will result in provision of significant amount of public open space. Furthermore, the additional demand created for the existing facilities with significant spare capacity is likely to enhance their vitality by increasing revenues.

5.12.6 The Development will therefore provide significant positive socio-economic effects for Loughborough Town and the wider Charnwood Borough.

6 LANDSCAPE AND VISUAL AMENITY

6.1 Introduction

6.1.1 A Landscape and Visual Impact Assessment (LVIA) has been undertaken by FPCR Environment and Design Ltd (FPCR) for the Development. This Chapter describes and evaluates the proposal for up to 3,200 dwellings, related land uses and a Strategic Link Road, from the A6(T) to the A512(T) with respect to the landscape and visual amenity of the Site and its surroundings. This Chapter sets out the baseline conditions, assesses the potential significant effects and outlines the design and mitigation measures to be incorporated as part of the Development. This assessment has formed an integral part of the emerging Masterplan for the Site.

6.1.2 The study area for this assessment is shown at Figure 6.1 and includes the western edge of Loughborough, extending westwards to Shepshed, northwards to Hathern and is defined to the south by hill landform to the south of the A512(T).

6.1.3 This Chapter has addressed relevant matters raised in Charnwood Borough Council's (CBC) ES Scoping Opinion. The following information is provided in response to Appendix 3, advice of the Council's Landscape Architect dated 13th March 2014:

- Further details on the Development including open space provision and mitigation are provided at para 6.5 Mitigation and Enhancement Measures, and also within the Design & Access Statement (DAS) and Green Infrastructure and Biodiversity Management Plan accompanying this application. A series of Parameter Plans are provided within the ES and these are referenced through this Chapter;
- Where appropriate, definitive wording as advocated in the Core Strategy has been used through this Chapter;
- The recently published Natural England Character National Character area profiles have been reviewed (Refer to paras 6.4.5-6.4.7);
- The phasing for the restoration of Garendon Park would be phased according to priority. Early works could include repair of monuments currently at risk, allowing public access to parts of Garendon Park along with some of the proposed woodland and avenue tree planting. The arrangements for such will be secured through the Planning Obligation or conditions attached to the grant of planning permission;
- The range of proposed recreational facilities has been discussed with CBC. Further details are provided within the DAS;
- Woodland planting proposed outside of the Site is within land under the Consortium's control as identified on the Parameter Plans. Typical widths of proposed woodland planting belts are described within this Chapter at Section 6.5 Mitigation and Enhancement Measures;
- The Parameter Plans have been amended to show the planting proposed between the employment area and Shepshed Watermill; and

- Section 6.5 Mitigation and Enhancement Measures, has been amended to include Sustainable drainage techniques throughout the Development. Swales and attenuation areas are shown on the Parameter Plans.

6.1.4 The following information is provided in response to Appendix 4, advice of English Heritage dated 12th March 2014:

- An integrated approach to the assessment has been undertaken. This Chapter cross references the Heritage and Archaeology Chapters at paras 6.4.18-6.4.24;
- Reference to the Leicestershire, Leicester and Rutland Historic Landscape Characterisation is provided at para 6.4.9;
- FPCR have met with English Heritage and agreed the locations of representative photo viewpoints, night time views and photomontages provided within this assessment; and
- An assessment of the Landscape effects upon Garendon Park is provided at paras 6.5.18-6.5.27. The Hermitage falls within the Black Brook Vale character area which is assessed at paras 6.5.30-6.5.34.

6.2 Legislation, Policy and Guidance

6.2.1 This Chapter has considered relevant national, regional and local planning and legislative framework in the context of landscape and visual issues. Further information on particular planning policies is provided at Appendix 6.2.

6.3 Assessment methodology and Significance Criteria

6.3.1 The methodology for this assessment combines the collection and analysis of baseline information, desk study and field survey. Potential landscape and visual effects have been identified and assessed. Measures are designed to either avoid or mitigate significant effects; these may include enhancements to the existing landscape which would then form an integral part of the Development. The resulting overall effect is described whether beneficial or adverse.

6.3.2 Landscape and visual effects have been assessed both at year one and in the longer term, when the structural planting proposed as part of the Development has matured. For assessment of the long term effects of the completed Development, it has been assumed that there will be fifteen years growth for proposed structural planting.

6.3.3 The Landscape Character and Visual Impact Assessment of the Development has been conducted in accordance with Guidelines for Landscape and Visual Impact Assessment, third edition (GLVIA3), published by the Landscape Institute and the Institute of Environmental Management and Assessment, in 2013. Further information is included at Appendix 6.1.

6.3.4 In summary the GVLIA3 states:

> *"Landscape and Visual Impact Assessment (LVIA), is a tool used to identify and assess the significance of and the effects of change resulting from development on both landscape as an environmental resource in its own right and on people's views and visual amenity."*

6.3.5 There are two components of LVIA

1) Assessment of landscape effects; assessing effects on the landscape as a resource in its own right; and

2) Assessment of visual effects: assessing effects on specific views and on the general visual amenity experienced by people.

6.3.6 These two elements are described separately in this Chapter.

6.3.7 The GLVIA3 recognises that professional judgement is a very important part of the process, and states that whilst there is some scope for quantitative measurements of some relatively objective matters, much of the assessment must rely on qualitative judgements (para 2.23).

6.3.8 In terms of baseline studies, the assessment provides an understanding of the landscape in the area to be affected, its constituent elements, character, condition and value. For the visual baseline this includes an understanding of the area in which the Development may be visible, the people who may experience views, and the nature of views.

6.3.9 Effects are determined by making judgement about two components:-

- The nature of the receptor likely to be affected (known by the shorthand 'sensitivity') and;
- The nature of the effect likely to occur (known by the shorthand 'magnitude').

6.3.10 Judgements on sensitivity are made by considering:-

- The susceptibility of the receptor to the type of change arising from the Development; and
- The value attached to the receptor.

6.3.11 Judgements on magnitude are made by considering:-

- The size and scale of the effect, for example whether there is a complete loss of a particular element of the landscape or a minor change;
- The geographical extent of the area that will be affected; and
- The duration of the effect and its reversibility.

6.3.12 In terms of mitigation, primary measures to prevent/avoid, reduce and, where possible, offset or remedy any adverse effects are developed through the iterative design process of the Development. This is described by the report and is included within the overall assessment of effects.

6.3.13 CBC has been consulted with regard to viewpoint locations for the LVIA. FPCR attended meetings with CBC during 2013 and 2014 to discuss and review the draft Masterplan.

6.4 Existing Baseline Conditions

Landscape Context

6.4.1 The landscape context of the existing study area is varied in character and includes residential settlements, historic parkland, agricultural land, main roads and other urban influences. Loughborough lies within the eastern part of the study area, whilst Hathern and Shepshed are situated further north and west respectively.

Topography

6.4.2 Landform across the local landscape is varied (refer to Figure 6.2). Low lying, gently undulating land is situated within central areas of the study area, between Loughborough and Shepshed, ranging between 50-65m AOD. Localised shallow valleys are associated with minor watercourses including Black Brook and Shortcliff Brook.

6.4.3 Topography within the wider landscape is more varied where hills and ridgeline occur. To the south Shepherd's Hill, Home Covert and Bunker Hill occur as land rises towards Nanpantan. To the north Hathern Hill and Bellevue Hill form a ridgeline which defines the local landscape.

Landscape Character

6.4.4 The landscape context of the Development has been evaluated at two levels:

i) By reference to the following previously published assessments of the area:-

- "*The Character Map of England*" published by Natural England;
- Leicester, Leicestershire and Rutland. Landscape and Woodland Strategy;
- Leicestershire, Leicester and Rutland Historic Landscape Characterisation Project (January 2010)
- East Midlands Regional Landscape Character Assessment (April 2010).
- Borough of Charnwood Landscape Character Assessment (July 2012); and
- Charnwood Landscape Capacity and Sensitivity Appraisal.

ii) Through a detailed assessment of the area's character.

National Landscape Character

6.4.5 The Site lies on the border of 2 Natural England National Character Areas (NCA) with land in the south lying within NCA profile Area 73: Charnwood, and land in the north lying within NCA profile Area 70 Melbourne Parklands. Relevant extracts from the NCAs are provided below. The location of Natural England's NCAs and Leicester, Leicestershire and Rutland, Landscape and Woodland Strategy Character Areas and the EMRLCA Regional Character Types are shown on Figure 6.3.

Natural England's NCA profile Area 73: Charnwood

6.4.6 Relevant Key Characteristics and extracts are as follows;

- *Upland qualities, including extensive open summits and distinctive rocky outcrops, rising from the surrounding lowland undulating farmland.*
- *Outcrops of ancient Precambrian rocks, with Mercia Mudstones in the vales; a significant proportion of the NCA is covered with superficial deposits of the Anglian ice age, as well as more recent deposits.*
- *Thin, acidic, infertile soils are found on upland slopes; mudstones in the valley bottoms produce a deeper, fertile soil.*
- *A well wooded character, with many areas of mixed, deciduous and coniferous woodlands. Large, ancient, pollarded oaks are a feature of country parks.*
- *Rectilinear patterns of Parliamentary enclosure fields, bounded by a mixture of drystone walls and hedges. Many of the country parks are also bounded by drystone walls. Enclosure has created a distinctive road pattern.*
- *Land use is a distinctive mixture of woodland, predominantly pastoral farmland, heathland and parkland.*
- *A diverse variety of habitats (including woodlands, acidic grassland and heathland) support a large range of characteristic and rare species.*
- *Clear, fast-flowing watercourses and significant, large, open waterbodies and reservoirs.*
- *Historic parks and country parks such as Bradgate and Beacon Hill, large manor houses and the remains of medieval monastic buildings like Ulverscroft Priory are all prominent cultural heritage features that attract many visitors from the surrounding urban areas.*
- *Local Charnian rocks, Swithland Slate roofs, thatched roofs and some timber-framed buildings characterise the Charnwood villages. Occasional linear villages and scattered farmsteads through the heart of Charnwood contrast with larger settlements, which ring the elevated areas. A number of large quarries and some busy roads have an urbanising influence in places.*

The forested character of the area is recorded in Domesday Book, identified as the woodland tract of Hereswode. The area remained generally uninhabited, with only one small settlement recorded at Charley. It was not until the 12th and 13th centuries that the woodland began to be cleared and settled. As new villages were created, principally in the lower and more fertile valleys, each took substantial areas of land out of Charnwood Forest for agricultural use. A secluded location and cheaply available land for cultivation favoured the establishment of monastic settlements in the medieval period. These included Garendon Abbey and Ulverscroft Priory. A number of medieval hunting parks were established around the core of the forested upland area, making use of land that was too poor for agriculture.

Large-scale modern development is having an impact on the intrinsic rural landscape character, by creating visual intrusion and increasing the risk of the coalescence of outlying villages. This trend looks set to continue, with more homes likely to be built in and around Leicester, Coalville and Loughborough.

***Sense of history**: Evidence of early clearance and cultivation is reflected in place names and characteristic small, irregular enclosed pasture fields, with mature woody hedgerows. Fragmented remains of open field system ridge and - furrow earthworks are common surrounding villages, and contrast with the more dominant pattern of 19th-century Parliamentary enclosures. Earlier winding tracks and lanes, leading from villages on the edge of Charnwood to the central woods and heathlands, are overlain by this grid pattern. The historic character is further reinforced by a number of large parks (such as at Garendon and Bradgate)...*

***Recreation**: Charnwood Forest is a popular leisure destination, particularly serving the populations of nearby Leicester and Loughborough, as well as visitors from further afield. The area contains a number of highly valued access amenity areas including The National Forest, country parks (such as Bradgate and Beacon Hill), green corridors, local nature reserves (such as Billa Barra) and accessible woodlands (such as the Outwoods).*

Statements of Environmental Opportunity

SEO1: Protect, manage and promote the important geology and cultural interests of Charnwood, including the internationally significant Precambrian geology, the characteristic rocky outcrops, the unique country parks, the manor houses and the medieval monastic buildings, to ensure access and interpretation, and for people to enjoy and understand these important resources.

- *Providing the necessary recreational infrastructure to meet the significant demand without detriment to the landscape.*
- *Maintaining and improving the distinctive drystone walls that bound the parks, as well as those found in the wider landscape.*
- *Protecting (through management) the open and elevated views across the upland landscape, which provide a sense of inspiration and a tranquil recreational resource.*
- *Protecting the historic designed parklands and their settings.*
- *Supporting and promoting participation in the Charnwood Forest Regional Park.*

SEO 2: Conserve the strong settlement character of the inner Charnwood villages and ensure that development is sympathetic to the character of this rural NCA, surrounded by large and expanding urban areas. Maximise the green infrastructure and sustainable recreation opportunities.

- *Protecting the character of the larger villages surrounding Charnwood Forest, and ensuring that new development and expansion are sensitively designed and located.*
- *Planning to limit the visual impact of any new development by locating it on previously developed land or close to existing settlements.*
- *Carrying out additional tree and woodland planting around settlement fringes to help integrate new development into the landscape, and to enhance existing well wooded village peripheries.*

- *Enhancing green infrastructure links between Leicester, Loughborough and Coalville, to promote the excellent recreational opportunities offered in Charnwood and to enhance ecological corridors which will encourage the spread of species and thus enhance adaptation to climate change impacts.*

SEO 3: Protect and significantly increase the extent and quality of the unimproved grasslands, heathlands, open waterbodies and streams, to enhance biodiversity, ecological networks, water availability and quality, climate regulation and sense of place.

- *Promoting the management of traditional field boundaries, including drystone walls and species-rich enclosure hedgerows.*
- *Creating a habitat mosaic of heathland, woodland and semi-natural grassland, creating structural diversity and a variety of flowering plants. This will provide breeding sites and a food source for pollinators.*
- *Conserving and extending riparian habitats such as bogs, marshes, reedbeds and wet alder woodland along the streams and surrounding the reservoirs.*
- *Promoting the extensive management of agricultural land within key waterbody catchments, to improve the water quality of streams and to increase biodiversity.*
- *Supporting the appropriate management of semi-natural Biodiversity Action Plan (BAP) habitats for the benefits this brings to biodiversity networks, as well as to facilitate the build-up of soil carbon, thereby improving soil quality and benefiting climate regulation.*

SEO 4: Where appropriate, manage and expand the native woodlands throughout Charnwood to reinforce the wooded character, to increase the potential for biomass, access and recreation, and to regulate climate change and water quality.

- *Extending and creating native woodlands where appropriate, through creation and restoration schemes in areas where this will not undermine the existing and future biodiversity resource or the mixed land-use character of Charnwood.*
- *Promoting sustainable woodland management techniques (such as coppicing, pollarding and wood fuel production) to increase carbon sequestration and the resilience of tree species to climate change and disease.*
- *Supporting The National Forest incentives to increase appropriate woodland creation and restoration, and to open up woodland access routes to the public.*
- *Extending woodland around settlements and infrastructure developments to filter light pollution, reduce sound pollution and reduce the visual impacts of further urbanisation.*
- *Protecting and managing veteran trees, to maintain this resource throughout Charnwood.*
- *Increasing woodland creation and restoration, and strengthening hedgerow networks to aid in the capture of chemicals and nutrients before they enter the groundwater. This will also filter sediments and organic matter, preventing them from travelling into open waterbodies.*
- *Creating woodland sensitively so as not to reduce the limited arable land, or obscure valued views and rock exposures.*

Landscape Opportunities

- *Conserve the character of the distinctive inner Charnwood villages, with their local building materials and linear settlement pattern. Protect the character of the larger villages surrounding Charnwood, and ensure that new development and expansion are sensitively designed and located.*
- *Limit the visual impact of any new development. Additional tree and woodland planting around settlement fringes will help to integrate new development into the landscape, and will enhance existing well wooded village peripheries.*
- *Manage field boundaries, including replanting where necessary, to ensure that any contribution made to the landscape pattern or biodiversity networks is maximised. Maintain and improve the area's characteristic drystone walls and hedgerows – especially in areas away from the country parks, where their condition is sometimes poor.*
- *Retain the woodland pattern throughout the well wooded area, increasing woodland where appropriate (for example in The National Forest), and retaining the open character of the landscape in the country parks.*
- *Manage the reservoirs and fast, well-oxygenated streams for the riparian habitats they provide and the rare species they support, and for their contribution to character. Manage farming practices to ensure that there is no negative impact on the watercourses.*

Natural England's NCA profile Area 70 Melbourne Parklands

6.4.7 Relevant Key Characteristics and extracts are as follows:

- *An undulating landform of Sherwood Sandstone in the west of the NCA, with Carboniferous limestones forming a broken ridge of hills in the east and extending south-eastwards.*
- *Large landscaped parks with grand country houses and mixed woodlands, and remnant orchards associated with market gardening.*
- *New woodland planting associated with The National Forest.*
- *There are many scattered, sometimes ancient, hedgerow trees in the core area. By contrast, low and well-trimmed hedges are found around some arable fields in peripheral areas.*
- *Extensive areas of unimproved pasture and remnant acid grassland with heathy scrub persist, with woodland on some steep, undulating sandstone slopes.*
- *Large, nucleated villages – the most remote built of attractive, mellow yellow brick, with a few surviving timber-framed buildings.*
- *Small, clustered red-brick villages retain a rural character, but those close to the River Trent valley, including Melbourne, Repton and Castle Donington, are larger.*
- *East Midlands Airport, with its important passenger and freight terminal, is located in the east of the NCA and serviced by the A42 and M1.*

Melbourne Parklands Today

The parkland and woodland are mutually reinforcing. Designed parkland avenues, parkland trees, hedgerow trees and remnant orchards in the surrounding farmland all add to the sense of wooded character and enclosure...One-quarter of the NCA is covered by The National Forest, and new woodland planting accentuates the rolling landform, further enhances the traditional wooded character of the NCA, and strengthens its links with neighbouring Charnwood and Needwood forests

The Landscape through time

At the onset of the Second World War, the need for food production prompted the conversion of grassland to arable land, and this was accompanied by a loss of hedgerows and field ponds. Dairying, market gardening and woodland management all declined in the post-war period.

Some 25 per cent of the NCA is within The National Forest. Tree planting began in 1990 in response to the fragmentation of the existing woodlands, and to the decline in industry and mining in central England.

Significant infrastructure projects have had an impact on the character of the NCA. The M1, Britain's first official motorway, was opened in 1959, and crosses the NCA close to its eastern boundary.

SEO 1: Manage the new planting of The National Forest and restore the characteristics of the historic parklands and woodlands. Conserve and manage the hedgerows and hedgerow trees, preserving the field patterns of early enclosures and maintaining the legacy of historic land use, bringing benefits for soil quality, biodiversity and recreation.

- *Ensuring the planting of indigenous tree and shrub species, including a proportion of large, long-lived species, and ensuring that any new plantations follow existing or historic patterns and guidelines set out by The National Forest.*
- *Securing a successor generation of veteran trees through the identification, protection and recording of candidate specimens. Conserving and renewing ornamental plantations and individual parkland trees over a long period of time.*
- *Retaining over-mature hedgerow trees for the habitat they provide and planting new saplings to ensure the continuity of mature hedgerow trees.*
- *Maintaining species-rich hedgerows, in particular those associated with earlier enclosure, gapping-up where necessary and ensuring any new planting is on historic field boundaries where relevant and where best able to secure benefits to soil erosion and soil quality.*
- *Managing and restoring areas of semi-natural grassland, through suitable land management.*
- *Protecting the settings of historic designed parkland, associated country houses, and estate farmsteads and villages, for the benefits to heritage and recreation.*
- *Working with developers to establish hedgerows of native species as part of commercial and residential development.*

SEO 2: Promote sustainable agricultural practices to help protect and manage areas of semi-natural habitat and, where appropriate, link these areas together to create a coherent and resilient habitat network.

- *Encouraging land owners and managers to take up conservation and/or environmental stewardship schemes that protect existing semi-natural habitats, and to appropriately manage areas that link together or buffer areas of semi-natural habitats.*
- *Encouraging sustainable farming practices through management plans, and promoting the suitable management of arable land to deliver habitat for farmland birds.*
- *Working in partnership with land owners and managers to investigate opportunities to link together woodland plantations, where appropriate.*
- *Working in collaboration with farmers to maintain levels of productivity and to maximise the benefits of varied and versatile soils, while investigating and applying management techniques that enhance landscape character and increase biodiversity.*
- *Working in collaboration with riparian land owners and managers to manage watercourses to prevent diffuse pollution entering the watercourses.*

SEO 3: Protect the important water resource in the NCA to safeguard the quality of public, private and agricultural water supplies, and to improve its contribution to biodiversity and recreation.

- *Ensuring a robust, permanent cover of vegetation, especially trees and scrub, that can significantly reduce soil erosion and filter water run-off.*
- *Expanding and restoring wetland habitats, particularly adjacent to watercourses, in areas where flooding is a risk.*
- *Enhancing the landscape character and ecological continuity of river corridors through the management, natural regeneration and planting of riparian vegetation.*
- *Working in collaboration with the Environment Agency to encourage developers to use sustainable urban drainage techniques to control the quality and quantity of water entering watercourses.*

SEO 4: Protect and enhance the historic landscape character and historic ecclesiastical centres. Promote opportunities for high-quality, accessible green space, and for the interpretation of historical features, increasing opportunities for community engagement, access, recreation and education.

- *Master-planning new urban expansions to ensure that accessible, multi-functional green spaces become an integral component, establishing a high-quality environment for the local community. Key views to and from settlements should be retained.*
- *Integrating the co-ordinated provision of green infrastructure into any development, ensuring that local communities have opportunities to enjoy their local green space and to take action to improve it.*
- *Ensuring that any development plans include areas for landscape character and biodiversity enhancement, for example wildlife corridors. This will increase the resilience of species to climate change.*

- *Improving access to the rights of way network and National Cycle Network through new rights of way that will offer increased opportunities for recreation near to where people live and work, contributing to creating a sustainable transport network.*

Landscape Opportunities

- *Maintain the ancient woodlands, estate mixed woodland, small game coverts, roundels, traditional orchards and tree belts to conserve the distinctive character of the parklands and to ensure the legacies of historic land use are preserved for future generations.*
- *Bring areas of ancient woodland, wood pasture and traditional orchards into management and expand areas of existing woodland. Consider successional planting over a long period of time to maintain the canopy and the wooded character of the NCA.*
- *Establish new woodland plantations that strengthen the mosaic of interconnecting habitats in The National Forest.*

Leicester, Leicestershire and Rutland Landscape Character Areas

6.4.8 The Site lies on the border of 2 Leicester, Leicestershire and Rutland Landscape Character Areas, with land in the south lying within the Charnwood Forest and land in the north lying within Langley Lowlands. Relevant extracts from these character areas are provided below.

Charnwood Forest

Charnwood Forest is particularly distinctive mainly due to the underlying pre-Cambrian rocks which result in a varied, hilly landform with exposed crags and rocky knolls and fast-flowing streams. The general elevation helps to give the whole area a distinctive feel and affects the local climate. The area borders the Soar Valley to the east, Langley Lowlands to the north, Coalfield to the west, and Upper Soar to the south. The boundary with each of these adjoining character areas is fairly clearly defined by topography.

The area is characterised by an intimate mixture of woodland and farmland in mixed arable and

pasture uses. There are also substantial areas of parkland and estate landscapes (eg Bradgate Park, Roecliffe Manor, Maplewell Hall, Charnwood Hall and Grace Dieu Priory).

The southern fringes of Shepshed and Loughborough also fall within the area. The use of local stone in vernacular buildings and drystone walls helps to give the area its strong and distinctive character.

The M1 runs north-south through the character area and is locally intrusive visually and in terms of traffic noise. The A511 linking Leicester with Coalville and Ashby-de-la-Zouch crosses the south-western corner of the area. The remainder of the area is criss-crossed by a network of minor roads, often running in very straight lines across the landscape.

Distinctive features

- *Upland landscape with rocky outcrops and fast-flowing streams;*
- *High proportion of woodland cover;*

- *Distinctive mixture of woodland, farmland, heathland and parkland;*
- *Part of the National Forest;*
- *Buildings and walls in local stone; and*
- *Many sites of ecological value.*

Issues

- *Lack of woodland, hedgerow and hedgerow tree management;*
- *Poor state of repair and/or part removal of drystone walls;*
- *Insensitive or inadequately mitigated built development;*
- *Pressure to extend existing quarries; and*
- *Visitor pressures in popular areas.*

Langley Lowlands

This character area is one of rolling landform dissected by minor watercourses draining northwards towards the Trent or eastwards to the Soar. It borders the two valley character areas of the Trent and the Soar to the north and west and has boundaries with the Coalfield and Charnwood Forest character areas to the south-west and south-east respectively. The extreme western part of the character area, around Staunton Harold, lies within the boundary of the National Forest.

Agriculture is a mixture of pasture and arable. Fields are medium to large and enclosed by well-kept mixed hedgerows. Many hedgerow trees are present, mainly oak and ash, and these add to the wooded character of the area.

Woodland is mostly deciduous and occurs in the form of small game coverts, with larger blocks of ancient woodland sites at Cloud Wood, Pasture Wood, Piper Wood and Spring Wood.

Parkland trees are also present around Langley Priory and Garendon Park.

A number of small villages are spread throughout the area, connected by quiet, narrow, winding lanes. A pattern of smaller fields surrounds some of the villages. Towards the west of the area, around Staunton Harold, the settlement pattern tends to be of scattered farms and hamlets. The small towns of Castle Donington to the north and Shepshed to the south lie on the boundaries of the character area.

Several A-roads run through the area, generally following higher ground, and connecting with larger settlements in Leicestershire and beyond. The area is bisected by the A42/M42, running roughly southwest/ north-east, which in places, and particularly at its junction with the M1 just outside the boundary of the character area to the north-east, is visually and audibly intrusive.

Distinctive features

- *Rolling landform;*
- *Well wooded appearance influenced by woodland within and beyond the character area;*
- *Quarries at Breedon Hill and Breedon Cloud;*
- *Many hedgerow trees;*

- *Villages linked by narrow winding lanes; and*
- *Parkland influences.*

Issues

- *Loss or decline of woodland through inadequate management;*
- *Insufficiently mitigated quarry extensions;*
- *Loss or over management of hedgerows and hedgerow trees through arable intensification;*
- *Road widening/improvements and new junctions (e.g. M42);*
- *Visitor pressures on historic parkland at Staunton Harold; and*
- *Expansion of East Midlands Airport and associated development.*

Leicestershire, Leicester and Rutland Historic Landscape Characterisation Project (January 2010)

6.4.9 The Leicestershire, Leicester and Rutland Historic Landscape Character (HLC) Project was carried out by The Historic and Natural Environment Team at Leicestershire County Council in partnership with English Heritage. The HLC provides information for developing an understanding of the historic dimension of the contemporary landscape**.** The majority of the Site falls within HLC Type Fields and Enclosed Land: Very Large Post-War Fields and Planned Enclosure. Other HLC Types include Plantation Woodlands, Parks and Gardens, Miscellaneous Floodplain Fields, Industrial Complex and Derelict Industrial Land and Other Small Rectilinear Field.

Very Large Post-War Fields

Description: *This HLC Type is characterised by very large fields, over 8.1 ha and often significantly larger...In most cases this will be the result of Post-War agricultural improvements intended to meet the requirements of intensive arable cultivation. This character type is distributed across much of the study area...*
Period: Modern. *The agricultural practices associated with this HLC Type start to be implemented after the Second World War with the introduction of new more powerful farm machinery. Under the European Union's Common Agricultural Policy financial incentives were linked to production; this provided the motivation for the removal of a large number of hedgerows during the later part of the 20th century.*
Factors influencing change: *Changes to or loss of field boundaries. Changes from pasture to arable farming. Built development.*
Biodiversity potential: Medium: *This HLC type, for the most part comprises more recent field boundaries typically laid out during the 18th and 19th centuries...Hedges, along with any trees within them, can provide an important food source and refuge for birds as well as act as 'corridors' for small mammals moving from one woodland habitat to another...Where the hedgerows associated with planned enclosure occur next to roads the verges are often fairly wide. Grassland verges can hold valuable communities of plants and animals...verges may represent the last remaining examples of unimproved neutral or calcareous grassland.*
Archaeological potential: Medium/High. *The potential for below ground archaeology is dependent upon previous land use and the agricultural regimes employed on the land since*

enclosure. Where fields have remained in permanent pasture for a significant period potential is likely to be higher. Any field or group of fields over 1ha will, for reasons of size, be considered to have an archaeological potential.

Management: *Regular maintenance to the form and shape of the field boundaries is crucial for preserving the integrity of this HLC type.*

Research Potential: *Documentary research can aid our understanding of the date of specific enclosures. Work is required to chart the loss over recent years of ridge and furrow earthworks. Where sites are under arable cultivation recently ploughed fields will have the potential to produce positive results from systematic fieldwalking.*

Amenity Value: Medium. *The amenity value of this HLC type will be highest when associated with other HLC types. Where present as isolated fragments the amenity value will be of lower potential. Amenity value also increases where there is good public access.*

Planned Enclosure

Description: *Planned Enclosure includes small or large fields with boundaries showing a geometric planned appearance. Laid out by surveyors this HLC Type is the result of later enclosure dating from the 18th and 19th centuries. This type includes commons enclosed by Act of Parliament.*

Period: Late-Post-Medieval. *These fields were deliberately laid out during the 18th and 19th centuries. However the ridge and furrow was created through open-field or strip cultivation dating from the early medieval period.*

Factors influencing change: *Changes to or loss of field boundaries. Changes from pasture to arable farming. Built development.*

Biodiversity potential: Medium: *This HLC type comprises more recent field boundaries typically laid out during the 18th and 19th centuries. Hedges and trees within them provide an important food source and refuge for birds and act as 'corridors' for small mammals moving from one woodland to another...Where hedgerows associated with planned enclosure are next to roads the verges are often fairly wide. Grassland verges can hold valuable communities of plants and animals. In many areas verges may represent the last remaining examples of unimproved neutral or calcareous grassland.*

Archaeological potential: Medium/High. *The potential for below ground archaeology is dependent upon previous land use and the agricultural regimes employed on the land since enclosure. Where fields have remained in permanent pasture for a significant period potential is likely to be higher. Fields over 1ha will, for reasons of size, be considered to have an archaeological potential.*

Management: *Regular maintenance to the form and shape of the field boundaries is crucial for preserving the integrity of this HLC type. Avoid ploughing where ridge and furrow is present.*

Research Potential: *Documentary research can aid our understanding of the date of specific enclosures. Work is required to chart the recent loss of ridge and furrow earthworks. Where under arable cultivation fields can produce positive results from fieldwalking.*

Amenity Value: Medium. *Amenity value is highest when associated with other landscape types. Amenity value increases were there is good public access.*

Broadleaved Plantation

Description. *This HLC type represents woods identified by the Forestry Commission as broadleaved. In this case a straight boundary morphology or the wood's name will suggest plantation at some point during the 19th or 20th century. This HLC type will typically be placed under a management regime that will see woodland thinned or felled wholesale on a regular basis. Faster growing species such as beech and wild cherry will be harvested at around 50 to 60 years. Oak may be as old 150 years when felled. Following the final harvest the woodland will be replanted. The management of woodland plantation from the mid19th century bears little resemblance to the traditional practices that had long been employed prior to this.*

Period: Modern. *Woodland plantation in Leicestershire is rarely earlier than 19th century in date.*

Factors influencing Change: *The main factor that will influence change in this HLC type is felling.*

Biodiversity potential: Medium: *Where plantation within this category is at its most intensive then biodiversity potential may be limited. High density woodland cover will result in shade inhibiting the growth of other plants. However within the National Forest where much of the most recent Broadleaf Plantation has occurred there has been an emphasis in promoting good new woodland design. The National Forest's own Biodiversity Action Plan seeks to "enhance the conservation value of existing plantation woodland and ensure appropriate management for wildlife in the planning of new woodland".*

Archaeological potential: Medium: *The archaeological potential of this HLC type will depend upon previous landscape use. Although earthwork features may be present within this type where intensive plantation has occurred archaeological remains are likely to have been severely damaged or destroyed.*

Management: *Where earthwork features have been identified within this HLC type further damage should be avoided and where possible their presence should be reflected in any planting regime.*

Research Potential: *Where concentrations of this HLC type occur or are in close proximity to Ancient Woodlands and evidence for woodland clearance then such types may provide evidence into the extent of previous wider woodland landscapes. Some woodlands falling within the category will be as a result of deliberate plantation and may represent elements of a wider hunting landscape.*

Amenity Value: High. *Where this HLC type occurs in close proximity to settlement then, where access is available, they are likely to be regarded locally as having an important local recreational resource. The National Forest recognises the high amenity value of woodland and actively seeks to promote and indeed funds schemes that will improve or enable access to woodland. This HLC type is often prominent as a local landscape feature with older examples in particular being associated with fox hunting.*

Miscellaneous Floodplain Fields

Description: *This category comprises areas of enclosure on river floodplain that do not fall into any of the Fields and Enclosed Land character types. Many of these fields will have been traditionally been used as meadows. Areas falling into this category have a potential for containing the preserved earthwork remains of water meadows. The distribution of this character type follows the river network.*

Period: Post Medieval/Late Post Medieval. *In most cases enclosure is likely to date from 18th and 19th centuries, although there are likely to be earlier examples dating from possibly as early as the 16th century.*

Factors influencing change: *Changes to or loss of field boundaries. In recent years there has been a marked increase in the levels of built development on floodplain land.*

Biodiversity Potential: Medium/High. *Fields that are characterised as this HLC type will, particularly during the winter months, be periodically flooded. This provides good quality habitat for wintering wildfowl. In spring these floods recede leaving wet grassland that is good for breeding waders.*

Archaeological potential: *High. Areas falling within this category will have a good potential for containing earthwork remains of water meadows. This character type will probably contain alluvial deposits. These deposits may be used for the provenancing of sediments, a range of landscape studies and for examining the past environments of river valleys. In addition, since river valleys have been amongst the most densely populated landscapes, there is a high potential for them to contain information about previous human settlement.*

Management: *Most areas within this category will be under pasture. Grazing on poorly drained or waterlogged sites can result in damage to the soil and vegetation, known as poaching, the run off from which can cause pollution if the area drains to a watercourse. When the soil dries out it can become compacted and need re-seeding. Defra advise that where hoof marks from cattle are deeper than 50 mm, stock should be moved away from at risk sites. This policy will also help reduce damage to any earthwork features. Maintain or improve drainage to keep soils drier where this is considered to be a natural and historic environment conservation objective.*

Research potential: High: *This HLC Type will have high research potentials for both geoarchaeological investigation and for landscape studies, notably into watermeadows.*

Amenity value: Medium. *The amenity value of this HLC Type will depend largely upon access. Within this HLC Type are many of the study area's principal rivers which are regularly used by anglers and walkers enjoying the countryside.*

East Midlands Regional Landscape Character Assessment (April 2010)

6.4.10 The East Midlands Regional Landscape Character Assessment (EMRLCA) covers the counties of Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire and Rutland. The EMRLCA was prepared by LDA Design for Natural England's East Midlands Region. It describes Regional Landscape Character Types, highlighting the key forces for change acting upon the landscape and broad guidance on shaping the future landscape.

6.4.11 The Site falls within the Wooded Village Farmlands from which key extracts are provided below:

Key Characteristics

- *Varied topography, ranging from gently undulating farmlands to rolling hills, becks and steep sided valley;*
- *Scattered farm woodlands, ancient woodlands on prominent hills and tree lined valleys contribute to a well wooded character;*

- *Well maintained pattern of hedged fields enclosing pasture and arable fields, with evidence of decline close to urban areas;*
- *Sparsely settled, with traditional pattern of farms and small rural villages linked by quiet country lanes; and*
- *Strong sense of landscape history.*

Landscape Character

The base-rich soils that can be easily improved are widely used for arable cropping, but areas, on the less well drained clays and along alluvial floodplains, are often characterised by verdant improved pastures grazed by cattle. Only limited remnants of semi natural vegetation remain in the agricultural landscape. However, broadleaved woodlands, copses and occasional meadows and unimproved grasslands in parkland are important, as are areas of connective habitats such as species rich grasslands, hedgerows and river corridors.

The landscape also has a relatively intact historic character, with sinuous hedgerow patterns and winding rural lanes evocative of medieval land management. Country houses also exert a strong, albeit localised influence on the landscape, with landscaped parks particularly prominent in the vicinity of Melbourne. Their influence can also be seen in the wider landscape in the form of game coverts, small scale plantations and estate farms.

The landscape, whilst not particularly tranquil, retains a quiet, rural character that appears to have changed little over recent decades. Some areas, notably those close to larger towns, are showing signs of decline, as are hedgerow networks in areas where there is an intensification of arable production.

Agricultural improvement and intensive farming has limited the retention of semi-natural habitats, although localised areas of species rich meadows and rushy riverside pastures are evident. The most prominent semi natural habitat is broadleaved woodland, which is an important component of the landscape, adding significantly to nature conservation interest in an otherwise intensively managed agricultural landscape. Woodlands are typically deciduous or mixed and are generally small to medium size. Of particular importance is the wide distribution of ancient woodlands, often prominently sited on hilltops and rising land. Parklands and estate copses and coverts further add to the well-wooded character of the landscape, as do the many willow lined streams and hedgerow trees.

As with other agricultural areas in the lowlands, hedgerows, hedgerow trees, riparian habitats and pollarded willows along streams are important as corridors between remnant woodlands and unimproved grasslands. However, across wide areas, and notably areas of intensive arable production, hedgerows are gappy, low and heavily clipped with few hedgerow trees. Hedgerows tend to be better maintained and form continuous habitat networks across steeper landform and on estate farmlands.

Cultural Influences

Other than in the vicinity of Laxton, post medieval enclosure of the landscape was widespread, and it is to this period, and notably the later 18th and early 19th centuries that the geometric patterns of straight enclosure roads and hedgerows can be dated.

In the centuries following enclosure, many areas were converted to farmland or reduced in scale. However, others prospered and were modified to form fashionable parklands surrounding a country residence.

Recent decades have seen relatively little change in the rural landscape. However, as with some other areas in the region, increasing reversion to arable farming and decline in hedgerow networks, as well as the introduction of new crops such as oilseed rape has had an impact on local landscape character and perceptions of landscape condition. As with other rural landscapes in the region, major infrastructure such as the M1 has also had an effect on local landscape character.

Aesthetic and Perceptual Qualities

Undulating landform and woodlands generally combine to create visual containment and sense of enclosure. Despite this, some panoramic and extensive views are possible from elevated locations where views are uninterrupted by intervening vegetation.

In some areas, and notably on the fringes of towns, or where agricultural regimes are shifting towards intensive arable production, gappy hedgerows and peri-urban land uses creates a sense that landscape quality is declining.

Built Development – Forces for Change

Villages within the Wooded Village Farmlands have seen limited growth and development. However, large scale modern mixed-use development is evident on the fringes of larger towns, such as Swadlincote and Loughborough, creating visual intrusion and resulting in the loss of surrounding countryside.

Built Development – Shaping the Future Landscape

The aim should be to manage the growth of larger settlements, ensuring development is appropriate in terms of design and scale, and consider the visual impact of any new development. Specific mechanisms include best practice innovative architectural designs and planning solutions, and planting of trees, helping to integrate new development into the landscape. Care should also be taken to prevent coalescence, ensuring separation is maintained between the urban fringe and surrounding settlements.

Infrastructure– Forces for Change

Localised road improvements have an urbanising effect and bring a degree of standardisation to the countryside.

Infrastructure – Shaping the Future Landscape

Manage road improvements to provide positive environmental and landscape enhancements and maintain the character of the rural road network. Measures may include grassland, hedgerows and tree planting along road verges to enhance character and increase the occurrence of semi-natural habitats.

Agriculture, Land Management and Fishing– Forces for Change

There is a marked evidence of agricultural intensification accompanied by a move towards arable production. This has resulted in the loss or damage of many typical landscape features, including traditional field boundaries and areas of ridge and furrow. The loss of pasture is particularly evident along the various river and streams which traverse the countryside.

Areas of parkland are also a feature of this landscape, contributing to the variety of land use and land cover. However, not all of the parkland is well managed and areas of pasture and woodland have been lost to increasing agricultural intensification.

Agriculture, Land Management and Fishing – Shaping the Future Landscape

The aim should be to protect existing rural landscape features, whilst encouraging positive management of those features lost or under threat. The restoration of hedgerows should be given priority, along with an increase in pasture, creating a stronger and more mixed pattern of land use. This will be particularly beneficial along watercourses, enhancing their visibility and creating a more integrated habitat network.

The aim should also be to manage parklands, ensuring their reinstatement and sustained contribution to landscape character and diversity. However, care should be taken to ensure that enhancements do not conflict with their original design and layout.

Forestry and Woodland – Forces for Change

Woodland is a significant component of this landscape, and new woodland planting would be generally appropriate, increasing the overall woodland coverage in the Region. However, any new woodland planting would be carefully sited as to avoid disrupting long-distance views and the sense of openness where it exists.

Forestry and Woodland – Shaping the Future Landscape

The aim should therefore be to plan for new woodlands, ensuring new planting schemes take full advantage of opportunities to enhance nature conservation and recreation, whilst respecting the pattern and scale of the landscape. Small to medium broadleaved woodlands are likely to be most appropriate, linked with existing semi-natural woodland by improvements to hedgerows and riparian habitats along streams and rivers.

Much of the area coincides with the 'Wooded Parkland' landscape type identified in The National Forest Strategy and which confirms that there is limited scope for large-scale planting. Here, the aim should be to establish small to medium sized mixed broadleaved woods that respect the

historic landscape character, together with farm woods and estate forestry, with some commercial plantations away from the parkland settings.

Borough of Charnwood Landscape Character Assessment (CBC July 2012)

6.4.12 CBC's assessment evaluates the landscape of the Borough and includes a landscape strategy with guidelines for the protection, conservation and enhancement of the character of the landscape, which will inform development management decisions and development of plans for the future of the Borough.

6.4.13 This Landscape Character Assessment and Charnwood Forest Landscape and Settlement Character Assessment are primary evidence to inform decisions on development.

6.4.14 The overall aim is to achieve high quality, sustainable development proposals, which will protect, conserve and enhance the character and appearance of the Borough's landscape, and reinforce local distinctiveness and sense of place.

6.4.15 The Site lies on the border of 2 Character Areas with the majority of the Site lying within the Langley Lowlands, and part of the north eastern part of the Site lying within the Soar Valley. Relevant extracts from the Character Areas are provided below. The locations of the Character Areas are shown on Figure 6.3.

Langley Lowlands

Key Characteristics

- *Rolling landform with gentle slopes;*
- *Large arable fields;*
- *Low hedges with few hedgerow trees;*
- *Open views from ridgeline roads, (Oakley Road/Tickow Lane, Hathern/Shepshed Road) and the M1 Motorway;*
- *Wooded fringes to streams in broad valleys;*
- *Garendon Park: Grade II Historic Park and Garden;*
- *M1 motorway divides the area; and*
- *Settlements are the western areas of Loughborough and northern Shepshed.*

Being on the cusp of three landscape character areas, the Langley Lowlands in Charnwood Borough show transitional features of its neighbours - the Soar Valley to its east, Charnwood Forest to its south and those of the Melbourne Parklands national landscape character area to its north and west.

Land Use

This area is predominately farmed, with small areas of woodland. The M1 motorway splits the area. The eastern and southern fringes of Langley Lowlands are transition zones to the towns of Loughborough and Shepshed. Shepshed's industrial buildings and estates are located between the A512(T) and the disused railway line. The historic parkland of Garendon Park with its

woodland tree belts and prominent garden buildings are a particular feature on the approach to Loughborough.

Farming

Most of the land is in intensive agricultural use, principally arable with large to very large fields. There is a minor element of horse-grazed paddocks and hay meadows.

Industry

There is a variety of industrial distribution and storage warehouses and factories on industrial estates alongside the A512(T) at Shepshed. These are generally integrated by woodland and tree planting alongside the roads and the disused railway line.

Outside the urban limits of Shepshed there is little evidence of industry other than Civic Amenity Sites and a sewage works. Their lights and fencing are locally intrusive in the countryside setting. There are long distance views of the tall cooling towers at Ratcliffe-on-Soar power station and the clouds of steam are a common feature in the sky.

Leisure & Recreation

A network of footpaths and lanes offers opportunities for informal recreation. Butthole Lane provides a well-used short-cut route between Shepshed and Loughborough, and is part of the National Cycle Network Route 6 which continues through Shepshed to Belton.

Communication

The presence of the M1 motorway has greatly affected the area, splitting it through the middle, cutting across the western corner of Garendon Park, eroding Piper Wood Ancient Woodland (outside the Borough boundary) and creating a permanent barrier across the landscape. The M1 is locally highly intrusive both visually and through the constant traffic noise it generates. Tall light columns over the motorway are visible even when the motorway itself is screened by bunds or trees; they create a substantial level of light pollution at night time.

The remaining rural road network consists of straight minor roads linking Shepshed with neighbouring villages to the north and west.

The redundant Charnwood Forest Railway, which linked Loughborough with the west of the county, skirts the southern boundary of the area. Its countryside sections are marked by trees.

A network of high-voltage electricity pylons runs across this landscape area.

Ecology

The area contains ten non-statutory Local Wildlife Sites, principally the Black Brook, small water meadows, roadside verges and The Hermitage...Oakley Wood is also a statutory Site of Special Scientific Interest.

Ancient woodlands and semi-natural woodlands adjoining this character area and plantation woodlands within form part of the biodiversity network. Although the major ancient woodlands are somewhat isolated, the plantation woodlands associated with Garendon Park and the de Lisle Estate are mostly well connected across the landscape.

The wooded valleys of the Black Brook and Grace Dieu Brook, and to a lesser extent Oxley Gutter, form the principal wildlife corridors across the landscape and link the area with both Charnwood Forest and the Soar Valley.

Heritage

Garendon Park, in the south-east of this area, is a Grade II Registered Historic Park and Garden, and site of the abbey and mansion are Scheduled Ancient Monuments. Although Garendon Hall was demolished in the 1960s and the western section of the Park cut off by the M1 motorway, the Park contains a range of garden monuments and features that are listed buildings. The most noticeable being the Grade I Triumphal Arch, Grade II Temple of Venus, and The White Lodge. Also listed are the Obelisk, cottages, barns, dovecote, walls and entrance arches, and the Stonebow bridge over the Black Brook. Possibly of mediaeval date, this bridge is on the route to Dishley Grange which was a grange farm of Garendon Abbey. Garendon Park grounds were landscaped from the 18th century onwards and elements such as small woodlands, treed avenues, man-made lake and reed bed survive to this day, whilst the granite wall is a remnant of a much larger deer park of earlier date. All these features give Garendon a distinctive parkland character, despite much of the land being currently arable.*

Woodlands surround most of Garendon Park, separating it from the nearby modern housing of western Loughborough.

Boundaries and Hedges

Where the land is under arable cultivation, there are few hedgerows and they are generally trimmed to a low level. There are very few mature hedgerow trees, particularly to the east of the motorway and on the higher land north-west of Shepshed. Where hedgerows are less intensively managed, some mature ash and oak trees are retained. Large open arable fields are, in some cases, partly bounded by woodland rather than hedgerows.

Woodland & Trees

Although much of the arable farmland has few large hedgerow trees, the area gains a more wooded character by its proximity to woodlands outside the character area and Borough boundary. Nearby woodlands in the Charnwood Forest landscape character area (Blackbrook and Hookhill and White Horse Woods) and Piper Wood and Oakley Wood, just beyond the Borough boundary to the north, are prominent features in the view and create a substantial backdrop of trees. Piper Wood has been fragmented by Ashby Road and the M1 motorway.

Large sections of the Grace Dieu Brook and Black Brook, and to a lesser extent, the Oxley Gutter, form the principal wooded corridors across the landscape, although some sections are very open. Trees associated with these watercourses are predominantly willows and common alder with some ash.

The south-east of the area is seen as a well wooded landscape with mature plantation woodlands, shelter belts and treed avenues of the existing and former de Lisle Estate. The Hermitage, Home Covert, Shepherd's Hill at Garendon Park, together with Hathern Drive, Bailey's Plantation, Gorse Covert and Booth Wood form an extensive and well-connected woodland scene in an otherwise arable landscape.

Garendon Park comprises well-ordered lime avenues and specimen trees at The Hermitage, including non-native trees and conifers, which convey a formal parkland setting.

A particular local feature is the avenue of alternating oak and conifers on the ridgeline with the Temple of Venus of Garendon Park.

Trees now mark the route of the redundant Charnwood Forest railway.

Hydrology

The minor watercourses of the Black Brook and Grace Dieu Brook, which form the Borough boundary, meander across the landscape flowing east to the River Soar. Water runoff from the adjacent intensively managed agricultural land is a source of nutrient enrichment which affects water quality.

There are very few ponds remaining in the landscape, a likely legacy of the extensive conversion of the farmland to arable production. A man-made lake and reed bed form part of the landscaped grounds of Garendon Park at The Hermitage.

Buildings & Settlements

The open and rolling nature of the landscape means that buildings can be highly visible from some viewpoints.

Linear tree screens define and screen the eastern built edge of Shepshed from the M1.

Some taller late-twentieth century houses on the high land of west Loughborough are visible, although they are fairly well screened by existing small mature woodlands and tree belts.

Strength of Landscape Character

The combination of rolling valley slopes of the Grace Dieu and Blackbrook watercourses with mature woodlands and wooded fringes of streams and new and old transport corridors, hedged large, mainly arable fields gives a varied and distinct landscape character.

The visual unity is distracted by glimpses of the Town of Shepshed, the electricity pylons and M1 motorway.

Landscape condition

Although some landscape features, particularly mature woodlands and tree fringed watercourses, are in good condition, some hedges are fragmented and there are generally few hedgerow trees around fields. The Temple of Venus and Triumphant Arch are both recorded as being on the Heritage at Risk Register by English Heritage.

Guidelines for Langley Lowlands Landscape Character Area

Conserve key views to the south and south west of Shepshed towards the higher ground of Charnwood Forest.

Conserve existing vegetation and tree cover at settlement edges, with management of wooded buffer planting to provide continued assimilation of development with a variety of heights and varied woodland species.

Conserve and enhance the historical structures and landscape features of Garendon Park in keeping with its tranquil setting.

Integrate new development and provide a setting by planting woodland edges and trees within and around the built form to break up roof line horizons and soften urban edges.

Take opportunities to strengthen gateway features along the A512(T) at entrances to the towns of Loughborough and Shepshed.

Take opportunities to improve off–road walking and cycling routes along the disused Charnwood Forest railway line, keeping its tree cover and wildlife corridor value.

Encourage the retention and restoration of the hedgerow network, thorough planting a new generation of hedgerow trees, planting up gaps in hedges and relaxing the management regime.

Where possible secure the conservation and management as appropriate of existing woodlands, eg those enclosing Garendon Park. Replace maturing woodlands with natural regeneration, and replanting with native species.
Protect and secure the wildlife value of the Black Brook, Grace Dieu Brook, Shortcliffe Brook, Oxley Gutter and other small water courses as wildlife corridors.
Preference will be given to the use of trees and hedgerow plants that are locally native to the Langley Lowlands character area in planting schemes.
Secure opportunities for the creation and enhancement of the following habitat types, particularly where they strengthen the countryside character near the towns:

- *Wetland habitats within floodplains (flower rich grassland, wet woodland, ponds etc); and*
- *Hedgerows and trees to grow on as standards within hedgerows.*

Charnwood Landscape Capacity and Sensitivity Appraisal

6.4.16 A capacity and sensitivity appraisal has been undertaken for those areas where there are options for major development. The appraisal has been prepared to inform decisions about the location of development, and also to provide information to help manage the landscape impact of any potential development.

6.4.17 Parts of the Site fall within zones 15 and 15a and are proposed for built development (Figure 6.13 refers). A Strategic Link Road is also proposed along the edge of Garendon Park, covered by zone 16. Relevant extracts are provided below.

Zone 15 – General Commentary

This zone is located between Loughborough, Shepshed and Hathern on the boundary between the Langley Lowlands and Soar Valley landscape character areas. It is situated partly on the terrace slopes of the Soar Valley and the undulating landform of the Langley Lowlands.

The higher part of the site is along its northern edge which forms a ridge line to Bellvue Hill from where the eastern part of the area slopes down to the Soar Valley on one side and both slopes of the Black Brook on the other side.
The northern area acts as a separation zone between Loughborough and Hathern.

Comments on suitability for development and mitigation measures:

*It is considered to have **Medium High** capacity to accommodate development. This is due to the undulating landform creating a bowl which is generally well contained from private views. It also has a link with the existing urban edge and would have a moderate impact on settlement separation. Residential development could be suitable subject to mitigation measures.*

Zone 15a – General Commentary

This sub-area of zone 15 consists of the higher land on the crest of the slope of Hathern Hill.
Vegetation is sparser.
It is more open to public view.
The fields are larger and more open than Zone 15, with vegetation restricted to well managed hedgerows.

Comments on suitability for development and mitigation measures:

*It is considered to have **Medium Low** capacity to accommodate development because of its elevated landform on a prominent slope with limited enclosure. Built development on this zone is undesirable because of the difficulty of screening development on such a visually exposed slope.*

Zone 16 – General Commentary

This zone is located between Loughborough and Shepshed on the boundary between the Charnwood Forest and Langley Lowlands landscape character areas. It is situated adjacent to the urban edge of Loughborough and is bounded on the south by Ashby Road (A512(T)) and the west by the M1 motorway.
The area of undulating land comprises primarily of the historic parkland associated with Garendon Hall which has fine views throughout of monuments and garden follies.
In parts the area has substantial tree cover.

Comments on suitability for development and mitigation measures:

*It is considered to have **Medium Low** capacity to accommodate development. This is due to the complexity, richness and texture of the landscape and it being an area of strong landscape character. Development within the area would have a significant impact on settlement separation and would be difficult to provide appropriate mitigation measures. Development could be appropriate in limited parts of the zone, subject to overcoming difficulties subject to mitigation measures.*

Garendon Park

6.4.18 In addition to this ES Chapter, further consideration of the historical development of the landscape and in particular the context of Garendon Park has been undertaken. Further details are provided within the assessment of Cultural Heritage ES Chapter 8 and Archaeology ES Chapter 7. Key findings from Chapters 7 and 8 are outlined below.

6.4.19 Beyond the Registered Park the archaeological interest in the Site is confined to below ground remains whose setting and relationship with the existing landscape make a neutral contribution to their significance. The current landscape largely comprises a mix of 18th-19th century planned enclosure (confined to the north-western part of the Site) and very large Post-War fields with patches of 19th century plantation. There are no surviving ridge and furrow earthworks within the Site and there is very little that survives within the existing field pattern to reflect the medieval or early post-Medieval farming practices.

6.4.20 Further information on key archaeological findings can be found in Chapter 7: Archaeology.

6.4.21 Overall the Registered Park, Garendon Park, is of considerable significance. This is mainly due to the contribution of the three eye-catchers as residual elements of the now almost completely lost, but historically significant designed landscape. Significant elements of the designed landscape such as the avenues have been lost and this has had a resultant impact on significant views and vistas. However, other features such as the eye-catchers, canals and remnants of the lost Garendon Hall survive. In the broadest sense something of the original design intention of the landscape with its underlying Arcadian character is still somewhat evident largely due to the three eye-catchers and remaining landscape features. However, the poor condition of some of these features does inhibit the ability to appreciate the significance of the Park.

6.4.22 A Scheduled Ancient Monument is sited in the northern part of the Park. The monument is divided into two sites and comprises the remains of a Medieval Cistercian Abbey, remnants of the demolished Garendon Hall and some 17th century garden features. The Cistercian monastery at Garendon is the only example of a Cistercian monastic site within Leicestershire making it unique in the locality and one of only 76 in the country, making this asset of national interest. Several above ground elements of the abbey can be seen which include the footings of the Chapter House and part of the Abbey drain which was later incorporated into the 17th century mansion.

6.4.23 There are also thirteen listed buildings within the boundary of the Park. These include structures associated with the demolished hall, farm buildings of Medieval origin and various lodges. Three of the most significant listed buildings within the Registered Park'ss boundary date from 1734-37 and are the eye-catchers designed by Ambrose Phillips as part of his landscaping scheme at Garendon Park. These buildings include the Triumphal Arch, Temple of Venus and Obelisk designated at grade I, II* and II respectively. These buildings are highly representative of their type and their survival contributes to the understanding of 18th landscape and folly design. The Triumphal Arch itself is of exceptional interest as it is likely to be the earliest known example of Roman remains directly influencing the design of an English structure.

6.4.24 Further information on key heritage findings can be found in Chapter 8: Cultural Heritage, Section 8.4: Baseline Conditions.

Detailed Character Assessment

6.4.25 The following detailed assessment of local landscape character has been undertaken by FPCR, using field evaluation and analysis of maps and other published data. The local landscape of the study area is influenced by a range of features and is described below by reference to local character areas shown on Figure 6.4. This provides a finer level of characterisation than the areas described in the Character Map of England, the Leicester, Leicestershire and Rutland Landscape Character Assessment, the EMRLCA or Borough of Charnwood Landscape Character Assessment.

Landscape Character Area 1: Garendon Park:

- Grade II listed on English Heritage's Parks and Gardens Register. The history of the present day Registered Park and Garden has its roots in the 12th century, when a Cistercian monastery developed the land and prospered over the following centuries.
- Following the dissolution of the monasteries in 1536 the ruinous abbey was developed as a residence and has been owned by the (Phillips) de Lisle family since 1684. Many documented changes to the buildings and landscapes have occurred since the 16th century. During the first half of the 18th century the existing manor house was replaced by Garendon Hall, a new country house designed by Ambrose and built following his death by his brother Samuel Phillips.

- Garendon Hall was demolished in 1964 and since this date the primary use of the Park has been for farming. Aside from the grade II Registered Park and Garden itself, there are fourteen designated heritage assets on the site, including a Scheduled Ancient Monument, comprising of the remains of the Cistercian abbey and Garendon Hall and various 17th century garden features. In addition there are thirteen listed buildings encompassing mainly lodges, structures associated with the now demolished Garendon Hall and three focal features (Triumphal Arch, grade I; Temple of Venus, grade II* and the Obelisk, grade II). The Triumphal Arch and Temple of Venus are included on English Heritages 'Heritage at Risk Register due to their current, declining condition.
- Despite a period of decline in the 20th Century a strong perimeter framework of woodland persists.
- Woodland combines with rolling topography to provide visual containment and a distinct sense of place.
- The majority of this area is under agricultural usage with large scale intensively farmed fields. There are smaller areas under pasture, including paddocks used to graze livestock.
- A private estate road is used to access existing properties, including White Lodge and also the former Home Farm buildings.
- A stone wall (grade II listed) defines part of the northern boundary of the Park.
- Views available of adjacent development include main roads (M1 and A512(T)) whilst residential properties at the north western edge of Loughborough are generally well screened by the framework of mature woodland.
- Shortcliffe Brook runs through the southern part of the Park between M1 Junction 23 and Shepherd's Hill.
- The area is considered to be of high sensitivity due to its archaeological and heritage value.

Landscape Character Area 2: Black Brook Vale

- Black Brook crosses the northern part of the study area, draining towards the River Soar. The floodplain follows a relatively narrow corridor along the length of the watercourse. Other minor watercourse include Oxley Gutter.
- Agricultural landscape predominantly under arable usage. Large scale fields are relatively open, with boundaries typically defined by either clipped hedgerows, tree belts or occasionally by woodland. Within parts of this character area, hedgerows are degraded where gaps or replacements with post and wire fencing occur. Localised areas of smaller scale pasture fields also occur.
- There are few notable features of landscape value within this area. The Hermitage and Bailey's Plantation are mature woodlands and feature within the local views.
- Recreational use within the area occurs along two east west public rights of way which provide routes between Shepshed and Loughborough. One of these routes running along Butthole Lane and Oxley Gutter forms part of the National Cycle Network.
- A network of electricity pylons crosses the area and are prominent within local views. Other detracting elements include a sewage works, a Civic Amenity Site and the M1 motorway to the west.

- Mature woodland, treebelt and hedgerows largely prevent intervisibility with both Garendon Park and also the adjacent residential development situated at the edge of Loughborough. There are partial views of the buildings such as the Red Arch Lodge situated within Garendon Park by Oxley Gutter. There are also longer distance glimpsed views of the upper part of the Obelisk and Temple of Venus from Hathern Hill.
- Hathern Hill and Bellevue Hill restrict intervisibility between this area and Hathern village to the north.
- Due to a combination of topography and existing vegetation, this area has a restricted intervisibility with the wider landscape.
- Overall this area is considered to be of low sensitivity.

Landscape Character Area 3: Hathern Hill

- Agricultural landscape much influenced by topography. Parts of Hathern Hill, Bellevue Hill and associated ridgeline are prominent within local views.
- Small to medium scale landscape; rectilinear field pattern with boundaries typically defined by clipped hedgerows.
- Oakley Wood is large in scale situated on locally high ground and screens local views of the M1 motorway.
- Hathern Road crosses this area providing a link between the settlements of Hathern and Shepshed.
- Agricultural track runs along Hathern Drive; a tree lined route which connects to the A6(T) and wider rights of way network which includes Pear Tree Lane and Oxley Gutter.
- Built development includes isolated farmsteads at Oakley Grange Farm, Lounds Farm and Bedlam Barn Farm.
- Electricity pylons are detracting features within local views.
- This area is of low to medium sensitivity.

Landscape Character Area 4: Hathern Agricultural Fringe

- Agricultural landscape located to the south of the A6(T), between Loughborough and the outlying villages of Hathern and Long Whatton.
- The area is much influenced by topography. Gently undulating hill slopes occur to the south of Hathern becoming more pronounced to the west.
- Small to medium scale landscape; rectilinear field pattern with boundaries typically defined by clipped hedgerows.
- Electricity pylons are detracting features within local views.
- The widened A6(T) carriageway connects Hathern with Loughborough. Other roads include Hathern Road to the west of Hathern and Ashby Road B5324 to the south of Long Whatton.
- Agricultural track runs along Hathern Drive; a tree lined route which connects to the A6(T) and wider rights of way network which includes Pear Tree Lane and Oxley Gutter. A footpath also links Hathern and Shepshed Road.

- Localised views of Hathern and Long Whatton villages are partially restricted by topography. There are glimpsed views of recent residential development situated to the east of Bailey's Plantation and at the edge of Hathern by Hathern Road. Upper slopes of Hathern Hill and Bellevue Hill enclose views to the south.
- This area is of medium sensitivity.

Landscape Character Area 5: Soar Valley

- Agricultural landscape which extends north eastwards beyond the study area.
- Low lying landscape gently falling towards the River Soar.
- This area forms part of the setting to the north of Hathern Village.
- A network of public rights of way extends northwards from Hathern.
- This character areas southern boundary is defined by a combination of Hathern Village, the A6(T) and the north western edge of Loughborough.
- This area is of medium sensitivity.

Landscape Character Area 6: Shepshed Urban Fringe

- The M1 motorway is the main urbanising influence on this area, situated to the east of Shepshed. Lighting columns occur along the M1 and the elevated Junction 23.
- The M1 road corridor is partly contained within cutting which, along with belts of woodland planting, have helped to reduce the visual effects of the motorway on the wider landscape.
- Noise generated by motorway traffic is often audible across the local landscape.
- The M1 embankments and associated belts of planting often create a visual barrier, restricting views across the wider landscape.
- Other detracting elements within local views includes electricity pylon, sewage treatment plant and quarry works.
- Development evident at Shepshed includes glimpses of buildings situated at Bunker Hill and Cow Hill.
- Recreational use includes a public right of way between Loughborough and Shepshed which part of the National Cycle Network. It runs along Butthole Lane and includes a footbridge over the M1. Another public footpath runs parallel to the M1 between Butthole Lane and Hathern Road.
- This urban fringe landscape is considered to be of low sensitivity.

Landscape Character Area 7: Loughborough Urban Fringe

- Land situated within the southern part of the study area between Loughborough and the M1 motorway.
- This area is much influenced by main roads, being bordered to the west by the M1 and to north by the A512(T).
- Land rises southwards towards Nanpantan, situated beyond the study area boundary.
- The LDF includes proposals for the University Science and Enterprise Park expansion across part of this area.
- Other existing development includes isolated farmsteads, properties and a golf course.

- Snell's Nook Lane provides a route between the A512(T) and Nanpantan.
- This area is of medium sensitivity.

Landscape Character Area 8: Loughborough Urban Settlement

- The western edge of Loughborough Town is located to the east of the Site and extends beyond the study area boundary.
- The Town's western edge is largely defined by residential developments. The area consists of varied development patterns and architectural form the majority of which dates back to the mid to late C 20th. Other more recent residential developments also occur such as by Pear Tree Lane to the south of the A6(T).
- The historic parts of the Town which are designated Conservation Areas are remote from the site. Within the Conservation Areas such as Victoria Street, Queens Park, Emmanuel Church, Shelthorpe by Loughborough Cemetery there are fine examples of housing ranging from small terraces to larger terraced villas and detached properties. Most of the older properties date from the late Victorian and Edwardian period.
- A range of high street retailers, independent shops, boutiques, restaurants, pubs and cafes are located within the Town Centre. The market place holds markets twice a week.
- The railway runs north–south through the eastern edge of Loughborough along the route known as the Midland Main Line.
- Vehicular access to the west of Loughborough is available from the M1 Junction 23 along the A512(T) Ashby Road. The north of the town can be accessed from Junction 24, travelling through Kegworth and Hathern on the A6(T).
- Loughborough University is among the country's leading universities and is noted for engineering, technology and sports related course. The University is the Town's leading employer.
- Mature woodland situated within Garendon Park and other woodland further north lie in close proximity to the settlement edge. This GI framework assists in integrating Loughboroughs north western edge within the surrounding landscape.
- Existing woodland often restricts views from Loughborough across the wider landscape.
- There are existing recreational greenspaces along the western edge of Loughborough including along the Black Brook and dismantled railway corridors, as well as to the south of Pear Tree Lane and A6(T). In addition there are playing fields associated with Thorpe Acre School and College.
- Recreational routes include a public right of way linking Loughborough and Shepshed which part of the National Cycle Network. It runs from Coe Avenue through the Black Brook vale (Character Area 2). There are also connections to other routes along Stonebow Walk and Pear Tree Lane.
- This area is of medium sensitivity.

Landscape Character Area 9: Shepshed Urban Settlement

- Shepshed originally grew as a centre for the wool trade.
- Shepshed lies to the west of the M1 and extends westwards beyond the study area boundary. Since the construction of the M1 motorway it has become a dormitory town for Loughborough, Leicester, Derby and Nottingham.
- The majority of Shepshed is defined by residential development, whilst a smaller area of industrial works occurs on land adjacent to the A512(T).
- The main vehicular access to the south of Shepshed is available from the M1 Junction 23 along the A512(T) Ashby Road. A network of secondary roads is also present. Hathern Road is located to the north of the Town and provides a link to the A6(T).
- Belts of woodland planting occur adjacent to part of the residential edge. This vegetation, combined with other woodland and embankment along the M1 corridor restricts wider views to the east.
- Recreational routes include a public right of way linking Shepshed and Loughborough which part of the National Cycle Network. It runs along Butthole Lane to the north of Shepshed High School through the Black Brook vale (Character Area 2).
- This area is of medium sensitivity.

Landscape Character Area 10: Hathern village

- Nucleated village settlement situated approximately 1km to the north west of Loughborough and is surrounded by agricultural landscape to the north (character area 4) and south (Character Area 3).
- The historic core of the village is designated a Conservation Area and includes Wide Street, Dovecote Street, Church Street and The Green. It includes a range of development including Medieval and post-Medieval settlement and subsequent Victorian and Edwardian expansion.
- Hathern appears to have developed as a small settlement clustered around the Church and linear development along Dovecote Street.
- There are several listed buildings, including the Church and village cross which are grade II* with the remainder grade II. The village cross is a Scheduled Ancient Monument. The Parish Church of St Peter and St Paul occupies a raised site and provides the main landmark within the village.
- Later mid to late C 20th residential areas outside of the Conservation Area. More recent residential development is located by Shepshed Road.
- Existing allotment sites are located at the edge of the village by Shepshed Road and Derby Road.
- The Derby Road A6(T) provides the main route through the village towards Loughborough, whilst Shepshed Road goes towards Shepshed.
- Rising ground to the south of the village includes Hathern Hill and Bellevue Hill which restricts wider views across the landscape.
- This area is of medium sensitivity.

Landscape Character Area 11: Long Whatton village

- The village lies to the east of the M1 approximately 6km to the north-west of Loughborough and extends beyond the study area boundary. The A42 also lies nearby to the west of the M1.
- Long Whatton lies within an agricultural landscape on the southern side of the shallow valley to Long Whatton Brook.
- Until the C18th the village developed with an agricultural based economy. In the C20th the village became dormitory in character with the development of new housing areas. The historic core of the village is designated a Conservation Area.
- The village has a linear settlement pattern. Main Street provides the major route through the village and Whatton Road links the village with the A6(T) to the East.
- The village is mainly residential although smaller industrial works are situated along Hathern Road to the East of the village and Whatton Road to the south. A sewage works is located just outside of the village to the east.
- Rising ground to the south of the village and Oakley Wood to the south east restricts wider views across the landscape.
- This area is of medium sensitivity.

Analysis of the Character Assessment

6.4.26 From the detailed character assessment a number of findings have been drawn:

- At a national level the study area lies on the boundary of Natural England Character Areas with Charnwood to the south and Melbourne Parklands to the north.
- At a regional level the East Midlands Regional Landscape Character Assessment was prepared by LDA Design for Natural England's East Midlands Region. The Site falls within the Wooded Village Farmlands within which the strategy is to increase appropriate woodland creation and restoration.
- The landscape context of the existing study area is varied in character and includes residential settlements, Registered Park at Garendon, agricultural land, main roads and other urban influences. Loughborough lies at the east of the study area, whilst Hathern, Long Whatton and Shepshed are situated further north and west respectively.
- Garendon Park is an area of high sensitivity due to its heritage and archaeological value.
- Other features of local landscape value include woodlands, such as the Hermitage, Oakley Wood and Bailey's Plantation, well established hedgerows, mature hedgerow trees and the Black Brook watercourse.
- Intensive agricultural usage currently occurs across much of Garendon Park. Large scale arable fields have inevitably eroded the parkland character.
- Intensive agricultural usage has also had an effect elsewhere within the study area. Degraded hedgerows occur within the area to the north of Garendon Park, where gaps or replacement with post and wire fencing occurs.

- The existing public rights of way network includes footpaths and bridleway which provide links between Loughborough, Shepshed and Hathern. Public rights of way within the Site along with Shepshed Road and Derby Road A6(T) form circular walks used by residents of adjacent settlements. A public right of way between Loughborough and Shepshed forms part of the National Cycle Network.
- A combination of the topography and framework of mature woodland within the study area restrict local views. Hathern Hill, Bellevue Hill and high ground by Oakley Wood prevent intervisibility between the villages of Hathern and Long Whatton and wider landscape to the south.
- Woodland within Garendon Park largely prevents intervisibility between Loughborough and wider landscape to the west. To the south of Garendon Park and the A512(T) ridgeline by Nanpantan restricts local views. To the west of the study area landscape associated with Shepshed urban fringe and M1 corridor largely restricts intervisibilty between Shepshed and wider landscape to east.
- Detracting features within local views include glimpses of the M1 motorway, sewage works, electricity pylons and distant views of industrial buildings.

Visual Resources

6.4.27 The interaction of urban fabric, vegetation and topography determines the potential for views across the study area. Receptors encompass residents, users of rights of way, open spaces and recreational facilities, views from highways and people at work. In overall terms, the first two categories are generally of higher sensitivity than the latter two, although the context of individual receptors can have a bearing on sensitivity.

6.4.28 A series of representative viewpoints (Ref. Figures 6.6 and 6.7) have been selected to illustrate the varying degrees of visibility across the study area and the potential effect on receptors. Although Garendon Park is not currently publically accessible, photographs within the Park are included at Figure 6.8. Written descriptions are provided alongside each photograph. Assessment of views from the M1 motorway, Loughborough, Hathern village, Hathern/Shepshed Road, the A6(T) and within Garendon Park are also supported by illustrative cross sections (Ref Figures 6.9 and 6.10). In addition the assessment will be supported by 4 photomontages (Ref Figures 6.11) and also photographs taken at night time (Ref Figures 6.12). Key findings are summarised below.

Analysis of the Visual Assessment

6.4.29 From the visual assessment a number of findings have been drawn.

Settlements

6.4.30 Westerly views from the existing western residential edge of Loughborough (Ref. Figure 6.7 Viewpoints 4, 5 and 9) are largely restricted by mature woodland and / or landform. Properties situated at the edge of a recent residential development, located to the east of Baileys Plantation, would potentially have views across part of the Site (Ref. Figure 6.7 Viewpoint 8).

6.4.31 Lower hill slopes to the north of Hathern Hill and Bellevue Hill largely prevent southerly views across the Site both from Hathern and the A6(T) (Ref. Figure 6.7 Viewpoints 19, 21, 33 and 34).

Undulating land to the north of Oakley Wood prevents southerly views across the site from Long Whatton (Ref. Figure 6.7 Viewpoints 38, 39, 40 and 41).

6.4.32 A combination of localised topography and vegetation occurs within Shepshed's urban fringe and along the M1 corridor. This prevents any significant easterly views from existing residential properties in Shepshed across the Site.

Public Highways and Rights of Way

6.4.33 There are intermittent, easterly views (Ref. Figure 6.7 Viewpoints 27, 28 and 29) across part of the Site from embanked stretches of the M1, situated to the north and south of Bunker Hill. The existing view (Ref. Figure 6.7 Viewpoint 27) includes lighting at the recycling centre located within the Site. There would be potential views of the Development adjacent to the M1 and on higher ground by Hathern Hill. In addition there is a localised glimpsed view of Garendon Park from the M1 to the south of Junction 23 (Ref. Figure 6.7 Viewpoint 42). Easterly views of the Site from parts of the M1 corridor are available over existing vegetation planted along the highway embankment and verges. Potential views of proposed built development from the M1 would be of limited duration.

6.4.34 Northerly views into Garendon Park from the A512(T) (between M1 Junction 23 and Snells Nook Lane) are partially filtered by tree belts along the disused railway line (Ref. Figure 6.7 Viewpoints 2 and 3). The ridge topped by the Triumphal Arch and the Temple of Venus is an important landmark which forms the near horizon and prevents any wider views further north. There are also distant views from Snell's Nook Lane which glimpse the Temple of Venus and the White Lodge (Ref. Figure 6.7 Viewpoint 1).

6.4.35 Easterly views from Shepshed Road (Ref. Figure 6.7 Viewpoints 35 and 36) and a footpath (Ref. Figure 6.7 Viewpoint 23) to the south of Hathern village across part of the Site are available through gaps in the hedgerow. Further to the south other views of the Site are available from Shepshed Road and adjacent rights of way by Hathern Hill which allow long distance views over existing agricultural land (Ref. Figure 6.7 Viewpoints 22, 24 and 25).

6.4.36 There are also various views across parts of the Site available from the existing public rights of way which pass through it. These include Butthole Lane (Ref. Figure 6.7 Viewpoints 6 and 14), footpaths by the Hermitage (Ref. Figure 6.7 Viewpoint 13), Oxley Gutter (Ref. Figure 6.7 Viewpoint 8) and to the north west of Garendon Park (Ref. Figure 6.7 Viewpoint 11), Hathern Drive (Ref. Figure 6.7 Viewpoints 12, 16 and 32), Pear Tree Lane (Ref. Figure 6.7 Viewpoints 16, 17, 18 and 20), footpath alongside the Black Brook (Ref. Figure 6.7 Viewpoints 30 and 31) and alongside the M1 (Ref. Figure 6.7 Viewpoint 26).

6.4.37 Visibility is locally restricted where established hedgerows and tree belt occur. Notable features along the routes, including minor watercourse, hedgerow, tree belt and woodland, would be retained. The context of the routes would alter, where built development is proposed nearby.

6.5 Assessment of Impacts, Mitigation and Residual Effects

Potential impacts & significant effects

6.5.1 Potential effects arising from the Development with respect to landscape and visual resources have been identified as part of the design process. These include both adverse and beneficial

effects during the construction phase and the occupation of the Site. Identifying such effects early on has assisted the development of the proposals, resulting in a considered and cohesive design approach overall. Without this, the following potential adverse effects in relation to landscape and visual resources could include:-

- Adverse landscape effects - whereby Garendon Park and other landscape features of value such as hedgerows, tree belt and public rights of way are completely or partially removed and no compensatory planting nor additional landscape enhancements or mitigation measures are incorporated. Given a low to high sensitivity and low to high magnitude of change the potential effect would be minor to substantial. However the mitigation and enhancement measures proposed below would prevent any permanent substantial landscape effects (Refer to paras 6.5.17-6.5.68).

- Moderate to substantial adverse visual effects through inappropriate design and a lack of mitigation strategy such as an ill-conceived Masterplan with the absence of GI, such as structural planting to assist screening and filtering of views. . However the mitigation and enhancement measures proposed below would prevent any permanent substantial visual effects (Refer to paras 6.5.69-6.5.107).

Mitigation and Enhancement Measures

6.5.2 The Development has evolved in response to baseline environmental surveys and assessments and the resulting identification of opportunities and constraints. Analysis and evaluation of local landscape character and visual resources has informed the Development. For example no buildings are proposed within LCA1: Garendon Park. The proposed built development would largely be located within LCA2: Black Brook Vale.

6.5.3 Although much of the Site is currently occupied by intensive arable farmland, there are areas of local character and features which are of value. A comprehensive GI framework will be introduced to assimilate the built development into its surroundings providing robust screening from sensitive viewpoints. The Development has been carefully designed so that the GI forms a well-defined cohesive framework, creating robust boundaries to the new neighbourhoods.

6.5.4 The Development provides an opportunity for Garendon Park to be restored, monuments to be repaired and the Park opened up to the public. Garendon Park will be restored to provide a local attraction for the communities of Loughborough, Shepshed and Hathern. Key elements of the restoration of Garendon Park would be undertaken during the initial phase of the Development. Such measures include allowing public access to parts of Garendon Park along with some of the proposed woodland and avenue tree planting.

Garendon Park

- A Conservation Management Plan (CMP) has been prepared by Heritage Collective for Garendon Park. It has assessed the heritage significance of the Park and proposes strategies for its future management.
- There is no public access through the Park at present. The majority of the agricultural areas of the Park are currently under intensive arable use and lacking in features of landscape value. Converting some of the arable fields to species rich grazing pasture and

planting avenues of parkland trees will be beneficial. It will enhance the local landscape and views and provide a focus for the creation of public access and recreation. Proposed public access routes for pedestrians and cyclists will utilise the existing private roads and tracks across the park. Routes will link to the existing rights of way network creating a local recreational resource.

- Existing historic buildings and monuments are in need of major repair. The Development will restore Garendon Park and repair its monuments. Listed buildings and features to be repaired include the White Lodge, Triumphal Arch, Temple of Venus, Canal, Arch, Chapter House, Obelisk, Red Arch Lodge and the Dovecot. In principle, agreement has been reached with English Heritage to progressively restore Garendon Park and its monuments in a manner which reflects the original 1777 Estate Map. Visitor and heritage facilities are proposed to be provided within the existing complex of listed buildings at the northern edge of the park by Oxley Gutter.
- The Development includes a Strategic Link Road, from the A6(T) to the A512(T). The Strategic Link Road has been carefully designed with particular consideration given to the existing character of Garendon Park. The proposed junction on the A512(T) is strategically located opposite the allocated University Science and Enterprise Park. It will be of high quality design to create a gateway entrance feature into the Park. Proposed belts of woodland and tree planting adjacent to the A512(T) along with the wider restoration of Garendon Park will also enhance the approach to Loughborough from the M1. The route of the Strategic Link Road will run parallel and close to the M1 corridor minimising impacts upon the Garendon Park and its historic buildings. The proposed alignment will avoid the ridgeline within the vicinity of the Temple of Venus and Triumphal Arch and disruption to the skyline. The Strategic Link Road, where feasible, will run at grade to minimise disruption to the existing landform. Proposed woodland, avenue and parkland tree planting will reduce the visual effect of the Strategic Link Road through Garendon Park.
- The Development will retain and enhance the existing framework of woodlands which currently screen existing residential development at the north western edge of Loughborough, and will also limit views of the Development from within Garendon Park. Some of the existing trees along the ridge by the Temple of Venus and elsewhere within parts of the recent plantations are of low quality and will be felled to enable the proposed avenue planting.
- No development or planting will be undertaken on the Scheduled Monument. Existing vegetation including woodlands and linear shelterbelt would be retained and enhanced to protect its setting.
- Sustainable urban drainage schemes would be provided outside the Registered Park, to avoid associated effects upon Garendon Park.

Residential Development and Related Land Uses

- The area proposed for development will be situated to the north of Garendon Park, the majority of which is situated within an area of low lying land, largely under arable agricultural usage. Locally higher ground occurs by Hathern Hill, Bellevue Hill and Bunker Hill.

- Built development will be set back from the edge of Garendon Park. There will be a 40-50m wide landscape buffer between the proposed buildings and the existing woodlands within Garendon Park. Existing woodlands such as Home covert and the Hermitage would be managed to ensure their long term future within the landscape. Additional belts of woodland planting and species rich meadow grassland are proposed within the landscape buffer zone which would enhance the framework of woodlands along the edge of the Park.
- Existing features such as woodland, hedgerows, public rights of way and wildlife corridors will be retained and enhanced within a GI framework. The proposed built development would be fragmented by corridors of open space extending from Garendon Park through the residential neighbourhood.
- Recreational needs will be provided to meet the requirements of CBC's emerging Core Strategy. A variety of recreational facilities are proposed including up to 9ha of playing fields, other sports facilities including indoor courts, outdoor multi-use games areas, 2.5ha allotments, around 7.7ha of amenity green spaces, and around 14 sites providing facilities for children and young people. The exact provision will be agreed following consultation with CBC and Sport England.
- The identities of Loughborough, Shepshed and Hathern will be maintained. The Development will maintain a sufficiently robust landscape buffer to prevent visual or physical coalescence with either Hathern or Shepshed. The provision of the restored Registered Park, Hathern Hill Community Park and other proposed GI will retain separation between Loughborough and Shepshed. A landscape buffer zone is proposed along the northern edge of the Site which will include belts of broadleaved woodland planting on the upper slopes of Hathern Hill and ridgeline by Bellevue Hill to prevent any significant intervisibility between the proposed built development and Hathern village. The proposed junction of the Strategic Link Road with the A6(T) is strategically located opposite the Dishley Grange employment site. An attenuation area proposed by the junction with the A6(T) will form part of an enhanced green gateway into the site. To the west of the Development the buffer zone will include belts of woodland proposed adjacent to the M1 motorway, between Oakley Wood and Garendon Park, in order to increase local tree cover and create an enhanced landscape buffer to Shepshed.
- The majority of the Site is low lying and has a very restricted visual envelope. The upper slopes at Hathern Hill, Bellevue Hill and Bunker Hill would not be built on to minimise any significant adverse effects upon the wider study area. Robust screening will be provided as part of the expansion of existing woodlands and hedgerows.

- There will be localised views across parts of the Site such as employment use buildings, residential houses and the Strategic Link Road from the M1 and Hathern Road/Shepshed Road. To minimise adverse effects the employment use development would be located on low lying ground, whilst the residential development would avoid the high ground on Hathern Hill and Bunker Hill. A substantial GI corridor typically 50m wide will accommodate new woodland planting adjacent to the M1 and Hathern Road/Shepshed Road which will restrict views of the proposed built development and ultimately prevent any significant adverse visual effects. Within the Site retained hedgerows and trees along with additional tree planting in areas of open space and within private gardens will also assist in softening views of the proposed built development.
- The majority of residential development will be at 2 storeys with some 2.5 storey properties (up to 10m). Higher density development will also include 3 storey properties (up to 12m). Primary schools will be 1-2 storeys (up to 12m). Community Hub buildings will be a maximum of 3 storeys (up to 13m). Employment buildings will be up to 12m. The proposals are shown on Parameters Plan C: Residential Density and building heights (Drawing Reference No. 1005/L/203).
- The Development will include a range of measures to control the use of artificial light without detriment to the lighting task. All lighting will be designed in accordance with guidance issued by the Institute of Lighting Engineers (ILE) in order to prevent light pollution. A lighting strategy is included within the Design and Access Statement.
- The Development has been carefully designed to prevent significant adverse effects upon the listed Shepshed Watermill by Hathern Road. Employment development will be set back from Hathern Road behind belts of proposed woodland planting.
- Existing vegetation of value including hedgerows and woodland will be conserved as part of the Development and incorporated and enhanced within a new reinforced GI framework. The proposals are shown on Parameters Plan E: Green Infrastructure (Drawing Reference No. 1005/L/205).
- Existing public rights of way will be retained as greenways, creating an attractive and readily accessible network which will create opportunities for sustainable travel and recreation. Additional/enhanced routes proposed along the Black Brook corridor will provide the opportunity to create a Greenway between Hathern Road and the edge of Loughborough. Part of an existing bridleway would be diverted through open space along the Black Brook corridor. The proposals are shown on Parameters Plan D: Access (Drawing Reference No. 1005/L/204).
- A new GI framework will create a network of corridors protecting and enhancing features of value. GI corridors are proposed throughout the Development to maximise opportunities for landscape and ecological enhancements. Locally native broadleaved woodlands will be created and ultimately form notable features along the ridgeline between Hathern Hill and Bellevue Hill. Proposed woodlands will enhance the local landscape and assist in assimilating the Development within the landscape.

- The GI framework will provide a variety of formal and informal recreational open spaces including facilities such as sports playing pitches by the Community Hub and Garendon Common, Hathern Hill Community Park and children's equipped play areas.
- 'Garendon Common' will be created along the Black Brook floodplain. Areas for informal recreation and wildlife enhancement are proposed whilst ensuring the potential for flooding and the effects of climate change are appropriately addressed from the outset. A proposed vehicular crossing over the Black Brook will be a low level structure to minimise impact upon the Black Brook. Pedestrian footbridges are proposed to provide additional crossing points over the Black Brook along Garendon Common. A pegasus crossing would be provided to enable a safe convenient bridleway crossing over the Strategic Link Road. Other fields along Black Brook will largely be retained in agricultural management. In terms of biodiversity and flood mitigation, Garendon Common and land retained in agricultural use will be designed to be beneficial.
- Sustainable drainage techniques will be used throughout the Development. Attenuation areas and swales will be located within the multifunctional GI framework, permeating through the Development and will be designed to provide biodiversity enhancements.
- Hathern Hill will be retained as a local landmark which will provide other community park uses including informal recreation and allotment gardens. Open views will be retained from the hilltop whilst avenues will create key vistas through the Development.
- New planting would utilise locally native species in order to strengthen the local landscape character and to maximise the Developments ecological benefits.
- Proposals are based upon the historic field pattern and would restore hedgerows, areas of pasture and create new woodlands.
- Belts of woodland planting proposed adjacent to the M1 motorway corridor, will assist in screening views of existing the sewage works and electricity pylons.

Demolition and Construction effects

6.5.5 The majority of the Site is currently under agricultural usage and therefore does not generate significant adverse construction impacts. Likely impacts, during demolition and construction works would principally be caused by the following:

- Clearance and set up of compounds;
- Loss of some landscape features;
- Works to existing highways;
- Road and building construction; and
- Construction traffic (HGVs and staff cars travelling to and from the site).

6.5.6 Localised compounds within areas of the Development would need to be levelled and a temporary surface laid. A variety of activities requiring a range of equipment will be ongoing throughout the construction. Delivery of temporary site offices, probably in the form of

portakabins and lockable containers are expected to arrive on large low-loaders and could be craned off as single units. Large plant items, such as tractor/excavators, rollers and dumpers will also need to be delivered. Some of these may arrive under their own power (for instance JCB type diggers are generally licensed for road use), whilst others may arrive by low-loader. Smaller items of plant will arrive on flat-bed lorries.

6.5.7 Construction of roads and accesses will require delivery of materials. These are likely to include bulk materials such as Type 1 aggregate and bituminous materials and individual pre-formed items such as kerbs, gully pots, drainage pipes, etc. The former would arrive by tipper truck and the latter on flat bed lorries. There may also be some requirement for ready-mix concrete deliveries at this stage, for instance for kerb foundations or backfilling around manholes. During building construction works localised areas will require re-grading, with excavated material re-used elsewhere on site. Delivery of bulk goods, such as sand and cement would be required. There would also be delivery of larger materials which include elements of prefabricated buildings. Such items are expected to arrive on low loaders and would be craned off as single units however the detail will be considered in subsequent reserved matters applications.

6.5.8 All construction works will be carried out in full accordance with best practice procedures to protect and to minimise any adverse impact on landscape character. Existing trees and vegetation, that are to be retained, will be suitably protected during the construction phase following best practice methods. A combination of existing vegetation, and localised topography would screen much of the construction activities from views within the wider countryside. Before construction commences on site the contractor will be required to install protective fencing in accordance with BS 5837, Trees in Relation to Construction.

6.5.9 Construction effects are relatively short term and would be largely screened from the existing edge of Loughborough. The likely significant effects resulting from construction are taken into consideration within the assessment of Landscape Effects and the assessment of Visual Effects below. The construction effects upon any one receptor are transitory in nature and localised views would be restricted to individual phases of development.

Night Time Effects

6.5.10 The Development extends westwards from the existing edge of Loughborough. In addition to the daytime visual assessment undertaken, the Site has been visited at night (Ref Figure 6.12). A range of light sources was observed both from Loughborough and elsewhere within areas surrounding the Site. Road lighting occurs along the main routes, notably the M1 (including the carriageway and elevated Junction 23), the A512(T) Ashby New Road and the A6(T) Derby Road. Street lighting is also present within the residential streets along the western edge of Loughborough. In addition light is emitted from the existing residential properties along the western edge of Loughborough and from employment development at the edge of Shepshed by M1 Junction 23. There is a sky glow associated with Loughborough. This area is judged to be of medium district brightness.

6.5.11 The SUE has been designed so that the development will be largely screened from the wider landscape, by a combination of the existing topography, mature woodlands and additional planting. The GI framework proposes belts of woodlands, along the site's northern and western edge.

6.5.12 A lighting strategy has been prepared for the Development and includes measures to minimise effects upon Garendon Park:

- The proposed Strategic Link Road through Garendon Park would be unlit;
- Cycleways proposed along existing roads and track through Garendon Park would include solar stud lighting; and
- Part of the existing National Cycle Route which runs along Oxley Gutter adjacent to Garendon Park would include bollard lighting.

6.5.13 There would be effects of sky glow and 'spots of light' both of which are already seen at the existing urban edge. However, all new lighting will meet the current environmental standards of good practice in order to reduce potential light pollution. Use of such measures proposed would ensure that the impact from light pollution would be negligible. The effects of lighting at night time are taken into consideration within the assessment of Landscape Effects and the assessment of Visual Effects below.

Landscape Effects

6.5.14 The Landscape effects of the Development are considered with reference to:-

- Statutory and non-statutory landscape designations;
- The appraisal of Landscape Character Areas (LCA) shown on Figure 6.4; and
- Individual components and features including trees, hedgerows, woodland, watercourse, pasture, landform and public rights of way.

6.5.15 This assessment considers that substantial effects would be a significant effect. Lesser adverse effects such as slight adverse effects and moderate adverse effects are also identified although these are not considered to be significant. Separate appraisals of the effect of the Development upon the historic environment are provided at chapters 7 (Archaeology) and 8 (Cultural Heritage). The following assessment of effects upon Landscape Character takes into consideration the relevant baseline information provided by those chapters. However from a landscape character perspective, the effects of the Development upon Garendon Park and the setting of its listed buildings and monuments are considered to be of less significance compared to the conclusions reached within the cultural heritage assessment (chapter 8).

6.5.16 Assessment at year 1 has been undertaken to assess the 'worst case' scenario and includes the effect of construction works for the Development. Where the assessment identifies that there are no likely significant adverse effects this takes into account any direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary effects as result of the Development. For assessment of the permanent landscape effects of the Development, it has been assumed that there would be fifteen years growth for proposed structural planting. At such time the vegetation would be well established at approximately 10m high.

Landscape Character Area 1: Garendon Park

6.5.17 Garendon Park is grade II listed on English Heritage's Parks and Gardens Register. The area is considered to be of high sensitivity due to its archaeological and heritage value. Aside from the

Registered Park and Garden itself, there are various designated heritage assets within Garendon Park. The site of the Abbey and Mansion are Scheduled Ancient Monuments whilst a range of garden monuments and features are listed. These include the grade I Triumphal Arch, grade II* Temple of Venus, the White Lodge, the Obelisk, cottages, barns, dovecote, walls and entrance arches. The Triumphal Arch and Temple of Venus are included on English Heritages 'Heritage at Risk Register due to their current, declining condition.

6.5.18 A comprehensive scheme of restoration of the buildings is proposed following a detailed condition survey of all listed buildings within the Registered Park. A Conservation Management Plan (CMP) for Garendon Park has been prepared and agreed with English Heritage. The CMP seeks to ensure the long term management and maintenance of the Registered Park and its features.

6.5.19 In principle agreement has been reached with English Heritage to restore Garendon Park in a manner which reflects the original 1777 Estate Map. Tree lined avenues proposed within the southern part of Garendon Park would connect the Triumphal Arch, Temple of Venus and the White Lodge whilst an avenue within the northern part of Garendon Park reconnect the Obelisk to the centre of the Park and Hall site. The Pleasure Grounds adjacent to the hall site are also proposed for restoration. Some of the existing trees such as those located along the ridge by the Temple of Venus and elsewhere within parts of the recent plantations are of low quality and will be felled to enable the proposed avenue planting.

6.5.20 The majority of the existing agricultural areas of the Registered Park are large scale open fields under intensive arable use and lacking in features of landscape value. Garendon Park would largely remain in agricultural use. Converting some of the arable fields to species rich grazing pasture and restoring avenues of parkland trees will enhance the local landscape.

6.5.21 There is currently no public access within Garendon Park. The Development would create public rights of way through Garendon Park which will link to the existing rights of way network and provide a local recreational resource. Visitor and heritage facilities are proposed to be provided within the existing complex of listed buildings at the northern edge of the park by Oxley Gutter. Vehicular access to the visitor facilities would be from the proposed residential development to the north of Garendon Park. Cycleways are proposed along the existing private roads and tracks across the Park and would include solar stud lighting at ground level to minimise the impacts of lighting at night time.

6.5.22 A strong framework of existing woodland around the perimeter of Garendon Park combines with rolling topography to provide visual containment from the adjacent residential edge of Loughborough. The framework of woodlands will be retained and enhanced with additional tree planting to bolster screening of existing residential development and filter views towards the M1.

6.5.23 Retained woodlands will also limit views of the proposed residential development from within Garendon Park. Built development will be set back from the edge of Garendon Park. There will be a minimum 40-50m wide landscape buffer between the proposed buildings and the existing woodlands within Garendon Park. Existing woodlands such as Home Covert and the Hermitage would be managed to ensure their long term future within the landscape. Additional belts of woodland planting and species rich meadow grassland are proposed within the landscape buffer zone which would enhance the framework of woodlands along the edge of the Park.

6.5.24 The Development includes a Strategic Link Road from the A6(T) to the A512(T). The Strategic Link Road would be located at the south western edge of Garendon Park in relatively close proximity to the existing A512(T) and the M1. The Strategic Link Road has been carefully designed with particular consideration given to the existing character of Garendon Park. The design of the Strategic Link Road through Garendon Park is informed by traditional parkland estate roads. It would be unlit through Garendon Park. Proposed lighting at the junction with Ashby New Road A512(T) would be located outside of Garendon Park. The road would have grass verges and not require an adjacent footpath/cycleway. Where feasible the Strategic Link Road has been designed run at grade to minimise disruption to the existing landform. Traditional post and rail fencing would be installed alongside the road where required to control livestock. The proposed signalised junction on the A512(T) is strategically located opposite the allocated University Science and Enterprise Park and outside of Garendon Park. Gateway features are proposed along the road corridor to define the entrances into Garendon Park. Proposed belts of woodland and tree planting adjacent to the A512(T) along with the wider restoration of Garendon Park will also enhance the approach to Loughborough from the M1. The route of the Strategic Link Road will run parallel and close to the M1 corridor minimising impacts upon the Garendon Park and its historic buildings. The proposed alignment will avoid the ridgeline within the vicinity of the Temple of Venus and Triumphal Arch and disruption to the skyline. Proposed woodland, avenue and parkland tree planting will reduce the visual effect of the Strategic Link Road through Garendon Park.

6.5.25 The Strategic Link Road along with its associated traffic would introduce a new element into this part of Garendon Park. The route of the proposed road would be along the edge of a large arable field and Home Covert. Lighting from traffic associated with the road would be visible at night time. However such views would be seen within the close context of the existing lit highways including the M1, elevated Junction 23 and Ashby New Road. However the impact of the Strategic Link Road and traffic would not result in a significant effect upon Garendon Park. Adverse effects upon Garendon Park would be limited to a localised area situated immediately adjacent to existing the A512(T), M1 and elevated M1 Junction 23. A narrow corridor of woodland would be required to be removed where the proposed road passes along the edge of Home Covert. Other hedgerow and tree removal would be limited to where the proposed road crosses Shortcliffe Brook. Such losses would be fully compensated for by the woodland planting and parkland trees proposed within this LCA along the road corridor.

6.5.26 There would be an obvious change upon Garendon Park during the initial construction works resulting in a minor adverse effect, which is not considered to be significant. However, as described above a comprehensive restoration scheme is proposed for Garendon Park which would be restored in a manner which reflects the original 1777 Estate Map. As the proposed planting matures there would be a permanent enhancement to Garendon Park which would result in a moderate benefical effect.

Landscape Character Areas 2 and 3

6.5.27 The majority of the Development occurs within an agricultural landscape (Character Areas 2 and 3). Within LCAs 2 and 3 the magnitude of change would be high, resulting from the proposed conversion of agricultural land into high quality residential neighbourhoods and employment development set within an extensive GI framework. The proposed GI framework retains existing features of value, which would be supplemented by a diverse range of enhanced or new habitats including locally native broadleaved woodlands, hedgerows, hedgerow trees, grassland and

wetland. Existing retained woodlands including the Hermitage and Bailey's Plantation and tree belts along Hathern Drive, Pear Tree Lane and the Black Brook corridor would be managed to ensure their long term future within the landscape. The proposed extensive public open space network would provide enhanced recreational opportunities throughout the Development. Footpath, bridleway and cycleway routes ensure connectivity throughout, linking to focal destinations within the Development as well as to the existing rights of way network. Safe crossing points on roads would be provided along the existing and proposed rights of way network. During the construction works there would be some localised losses of existing vegetation including trees, hedgerows, tree belt and pasture field. The features proposed to be removed would be fully compensated for by the range of habitats proposed to be created.

6.5.28 A variety of recreational facilities are proposed within LCAs 2 and 3. The exact provision will be agreed following further detailed consultation with CBC and Sport England.

Landscape Character Area 2: Black Brook Vale

6.5.29 A range of low, medium and high density development is proposed within LCA 2. Areas of lower density are proposed to the south of this area adjacent to Garendon Park whilst areas of higher density are concentrated adjacent to the main street by the proposed Community Hub and primary school. An existing residential property by the Hermitage at the edge of Garendon Park would be retained. The majority of residential development will be at 2 storeys with occasional 2.5 storey development. Community Hub retail buildings will be up to 3 storeys whilst the primary school and sports hall would be 1-2 storeys. The proposed employment area would be located between the Strategic Link Road and the M1 within which employment use buildings would be up to 12m high. An electricity sub-station would be located by existing pylons adjacent to the proposed employment area. It will include 132KV to 11KV infrastructure including terminal towers and single storey buildings up to 5m high. The proposed Community Hub and employment areas are located on low lying areas adjacent to the Black Brook. The existing Civic Amenity Site and sewage works would be retained in a central location within the proposed employment area. Other development would include a vehicular bridge and pedestrian footbridges over the Black Brook. There would be artificial lighting associated with the proposed residential, employment, Community Hub and primary school developments. Lighting columns would also occur along the Strategic Link Road and network of secondary roads and lanes. Within sensitive locations such as by the Black Brook, adjacent to Garendon Park and along Hathern Drive the proposed cycle routes would be lit by low level lighting to minimise night time impacts.

6.5.30 The majority of existing features of value within LCA 2 including watercourses (the Black Brook and Oxley Gutter) and associated floodplain field hedges, tree belts and rights of way would be retained and protected within the proposed GI. These retained features form the framework for linked GI corridors and provide further opportunities for enhancements including recreation, habitat creation and SUDs. A major corridor of open space will run through the core of the site along the Black Brook connecting Loughborough's existing urban edge to the surrounding countryside. 'Garendon Common' would be created within the central part of the Black Brook corridor alongside the Community Hub and would become a focus for the new community. Garendon Common will include areas for informal recreation, wildlife enhancement and SUDs attenuation areas. Proposed bridges would create conveniently crossing points within Garendon Common along the Black Brook and enable good connectivity to the Community Hub. Other fields along Black Brook will largely be retained in agricultural management. In terms of biodiversity and flood mitigation, the Black Brook corridor will be designed to be beneficial.

6.5.31 A variety of formal and informal recreational facilities are proposed within the Development. Garendon Common would link into a significant area of formal open space proposed adjacent to the Community Hub which includes 9ha of playing fields and a sports hall with indoor sports courts and changing rooms. Other recreational facilities include outdoor multi-use games areas, outdoor gym equipment, several play areas providing facilities for children and young people. An allotment site is also proposed. Existing public rights of way will be retained as greenways, creating an attractive and readily accessible network which will create opportunities for sustainable travel and recreation. Connections with adjacent settlements are proposed to be enhanced. A National Cycle Route between Loughborough and Shepshed passes through the Site and is proposed to be lit. A public right of way would also be extended to Shepshed along Coach Road. Additional/enhanced routes are proposed along the Black Brook corridor and elsewhere through the GI network. A short section of an existing bridleway would be diverted along Garendon Common through open space by the Black Brook.

6.5.32 The proposed GI corridors would permeate through the new neighbourhood which will create a fragmented edge to the built development particularly within those areas adjacent to Garendon Park. Proposed low density residential development will be set back from the edge of Garendon Park. There will be a minimum 40-50m wide landscape buffer between the proposed buildings and the existing woodlands within Garendon Park. Belts of locally native broadleaved woodland planting and species rich meadow grassland are proposed within the landscape buffer zone. Proposed avenues of trees will create key vistas through the Development and create strong links between Garendon Park and the new neighbourhood.

6.5.33 The completed Development includes a range of landscape enhancements proposed within the GI framework which would result in an overall minor beneficial effect upon LCA 2.

Landscape Character Area 3: Hathern Hill

6.5.34 A range of low, medium and high density development is proposed within LCA 3. Areas of lower density are proposed within the northern part of this area along the ridgeline between Bellevue Hill and Hathern Hill whilst areas of higher density are concentrated adjacent to the Strategic Link Road by the proposed primary school. The majority of residential development will be at 2 storeys with occasional 2.5 storey development whilst the primary school would be 1-2 storeys. The existing property at Bedlam Barn Farm would be retained. There would be artificial lighting associated with the proposed residential and primary school developments. Lighting columns would also occur along the network of secondary roads and lanes. Within sensitive locations such as along Hathern Drive the proposed cycle route would be lit by low level lighting to minimise night time impacts.

6.5.35 Existing features of value within LCA 3 including rights of way, tree belts, field hedges, and upper slopes by Hathern Hill and Bellevue Hill would largely be retained and protected within the proposed GI. These retained features form the framework for linked GI corridors and provide further opportunities for enhancements including recreation, habitat creation and SUDs. The main GI corridors within this LCA will run along the northern edge of the Development, retaining a continuous green buffer to Hathern, and to the west of the site creating a green buffer along Hathern Road.

6.5.36 A variety of recreational facilities are proposed within the Development. Hathern Hill Community Park will be retained as a local landmark which will provide public open space uses including

informal recreation, a childrens play area and allotment gardens. Open views will be retained from the hilltop whilst avenues will create key vistas through the Development. Other recreational facilities proposed elsewhere within the GI will include other play areas providing facilities for children and young people.

6.5.37 Existing public rights of way will be retained as greenways, creating opportunities for sustainable travel and recreation. Connections with Hathern village are proposed to be enhanced. Public rights of way would be extended along Hathern Drive and also along the proposed Strategic Link Road to the A6(T) by Hathern village. GI corridors would permeate through the proposed new neighbourhood creating opportunities for other new routes linking to key destinations such as the community park, primary school, Garendon Common, the Community Hub and existing rights of way. Proposed public footpath routes would also run along the ridgeline by Hathern Hill.

6.5.38 Proposed belts of locally native broadleaved woodland planting along the ridgeline to the north of the Development will provide the separation of between the Development and Hathern village. Belts of woodland proposed by Hathern Road will include strategic gaps to retain views to the south across the Black Brook. Proposed belts of woodland planting will enhance the local landscape and assist in assimilating the Development within the landscape.

6.5.39 The completed Development includes a range of landscape enhancements proposed within the GI framework which would result in an overall minor beneficial effect upon LCA 3.

Landscape Character Area 4: Hathern Agricultural Fringe

6.5.40 This agricultural landscape is located to the south of the A6(T), between Loughborough and the outlying villages of Hathern and Long Whatton. The vast majority of this character area lies outside of the site and would not be affected by the Development.

6.5.41 Part of the Development would be located adjacent to the existing residential edge of Loughborough by the A6(T) within LCA 4. Existing arable land would be replaced by medium density residential development and an adjacent section of proposed Strategic Link Road which links onto the A6(T). The majority of residential development will be at 2 storeys with occasional 2.5 storey development. The proposed roundabout junction of the Strategic Link Road with the A6(T) is strategically located opposite the Dishley Grange employment site. There would be artificial lighting associated with the proposed residential development. Lighting columns would also occur along the Strategic Link Road and junction with the A6(T).

6.5.42 The proposed GI framework retains existing features of value, which would be supplemented by a new habitats including woodlands, grassland and wetland. Existing retained hedgerow and trees along Pear Tree Lane would be managed to ensure their long term future within the landscape. Footpath and cycleway provision along the Strategic Link Road would ensure connectivity onto the A6(T). During the construction works there would be some localised losses of existing vegetation including a few trees and short sections of hedgerow at the junction of the Strategic Link Road and the A6(T). Such losses would be fully compensated for by the range of habitats proposed to be created.

6.5.43 A belt of locally native broadleaved woodland planting is proposed adjacent to the Strategic Link Road which would link into the woodland planting proposed along the ridgeline by Hathern Hill (within LCA 3). The proposed woodland will enhance the local landscape and assist in assimilating the Development within the landscape. An attenuation area would be created by the

junction with the A6(T) as part of the SUDs and will form part of an enhanced green gateway into the Site.

6.5.44 The Development would result in a low magnitude of change upon this landscape. Initially there would be a minor localised adverse effect becoming beneficial upon completion as a result of the proposed landscape enhancements.

Landscape Character Area 5: Soar Valley

6.5.45 This low lying landscape along the River Soar lies to the north of the A6(T) and forms part of the setting to Hathern village. A combination of existing topography which includes Hathern Hill and Bellevue Hill along with existing vegetation cover and proposed woodland (along the ridgeline between Hathern Hill and Bellevue Hill) would prevent any significant views of the proposed built development. There would be no significant adverse effect upon this area.

Landscape Character Area 6: Shepshed Urban Fringe

6.5.46 This LCA lies to the east of Shepshed extending to the edge of the Site. The existing urban fringe character of this area within the Site is much influenced by the M1 motorway, whilst other existing development includes electricity pylons, a sewage treatment plant and Civic Amenity Site.

6.5.47 Continuous belts of locally native broadleaved woodland planting are proposed adjacent to the M1 which would enhance the local landscape and assist in assimilating the Development within the landscape. Other land by Bunker Hill which lies outside of the Site boundary would be retained in agricultural use. Part of this LCA proposed for development includes a vehicular access point by Hathern Road, an employment area, Gypsy, Traveller and Showman sites. Built development would be set back from the M1 and Hathern Road behind the woodland buffer. Employment use buildings would be up to 12m high whilst buildings within the Gypsy, Traveller and Showman sites would be up to 5m high. Built development is proposed on low lying areas adjacent to the existing sewage treatment plant and Civic Amenity Site. The proposed GI framework will prevent any significant adverse effects upon the listed Shepshed Watermill by Hathern Road.

6.5.48 Existing public rights of way to be retained and enhanced along greenways include part of the National Cycle route along Butthole Lane and a public footpath which runs parallel to the M1 between Butthole Lane and Hathern Road. Footpath and cycleway provision along the proposed access road to the south of the Black Brook corridor ensure connectivity from the Development onto Hathern Road.

6.5.49 The Development would result in a low magnitude of change upon this landscape. Initially there would be a minor adverse effect becoming beneficial upon completion as a result of the proposed landscape enhancements along the M1 corridor and Hathern Road.

Landscape Character Area 7: Loughborough Urban Fringe

6.5.50 This LCA is located to the south of Garendon Park and extends from the M1 towards the western edge of Loughborough. The vast majority of this character area lies outside of the Site and would not be affected by the Development.

6.5.51 The Development includes a Strategic Link Road between the A512(T) and A6(T). The proposed signalised roundabout junction onto the A512(T) lies at the edge of this character area.

6.5.52 Localised hedgerow and tree removal would be limited to where the proposed road joins the A512(T) and crosses the dismantled railway corridor. Such losses would be fully compensated for by the locally native broadleaved woodland planting proposed along the Strategic Link Road corridor between the existing A512(T) and the dismantled railway corridor. The junction has been designed to tie in with the existing footpath and cycleways along the A512(T). Other public access enhancements would include provision of a footpath/cycleway from the A512(T) along the existing estate road through Garendon Park. In addition a footpath/cycleway route is proposed along part of the dismantled railway corridor within the Site, between the existing estate road and the western edge of Loughborough. The proposed restoration of Garendon Park (LCA1) would enhance the approach to Loughborough from the M1 Junction 23.

6.5.53 The Development would result in a low magnitude of change upon this landscape. Initially there would be a minor adverse effect becoming beneficial upon completion as a result of the proposed enhancements along the A512(T) corridor.

Landscape Character Area 8: Loughborough Urban Settlement

6.5.54 The Development would create a SUE on land situated to the west of Loughborough. High quality development would replace the agricultural land (within Character Areas 2, 3 and 4) which would extend the residential area to the west of Loughborough. The proposed GI framework would ensure that the identities of Loughborough, Shepshed and Hathern will be maintained.

6.5.55 The Development would be well connected to Loughborough with a range of proposed footpath, cycleway and bridleway routes linking into the existing settlement edge. These include the National Cycle Route Network and another strategic footpath/cycleway route proposed along the dismantled railway corridor.

6.5.56 The GI framework proposed within the Site would create an enhanced setting to the west of Loughborough. New areas of open space will be created which will enhance recreational opportunities. As described above a comprehensive restoration scheme is proposed for Garendon Park (LCA 1) which would create a significant open space accessible for the existing community. Another major corridor of open space is proposed through the core of the site (LCA 2) along the Black Brook connecting Loughborough's existing urban edge to the surrounding countryside. Other areas of open space are proposed by Hathern Hill (LCA 3) and to the west of Pear Tree Lane linking into existing park by Darwin Crescent. The proposed GI network would link into existing routes by the edge of Loughborough along Stonebow Walk and Pear Tree Lane. The framework of woodlands within the Site situated by the existing residential edge of Loughborough will be retained and enhanced.

6.5.57 The Development would enhance the setting to Loughborough's residential edge. The magnitude of change to this LCA would be low and result in a minor beneficial effect.

Landscape Character Area 9: Shepshed Urban Settlement

6.5.58 Shepshed is located to the west of the Site and would be separated from the Development by an urban fringe landscape (LCA 6) along the M1 corridor. The proposed GI framework would ensure that the identity of Shepshed will be maintained. Belts of locally native broadleaved woodland

planting are proposed adjacent to the M1 (within LCA 6) which would increase tree cover and enhance the local landscape.

6.5.59 The Development would be well connected to Shepshed. A range of footpath, cycleway and bridleway routes are proposed within the site which will link into the existing highways and rights of way network. These include the A512(T), Hathern Road, the National Cycle Route Network along Butthole Lane and a proposed footpath/cycleway route along Coach Lane.

6.5.60 New areas of open space will be created which will enhance recreational opportunities for Shepshed. The main areas of proposed open space will be provided at Garendon Park (LCA 1) along the Black Brook corridor (within LCA2) and at Hathern Hill (LCA 3). The proposed open space would be conveniently accessed off the existing and proposed rights of way.

6.5.61 The Development would enhance the wider setting to Shepshed. The magnitude of change to this LCA would be low and result in a minor to negligible beneficial effect.

Landscape Character Area 10: Hathern village

6.5.62 Hathern is located to the north of the Site and would be separated from the Development by Hathern's agricultural fringe (LCA 4) located to the south of the A6(T). The proposed GI framework would ensure that the identity of Hathern will be maintained.

6.5.63 GI corridors in the site (within LCA 3) will run along the northern and north western edge of the Development creating a continuous green buffer to Hathern. Proposed belts of locally native broadleaved woodland planting along the ridgeline at the northern edge of the Development will screen the proposed housing from Hathern village.

6.5.64 Residential areas of low density proposed along the ridgeline between Bellevue Hill and Hathern Hill would be set back behind a belt of woodland planting. The proposed residential development and Strategic Link Road (within LCA 4) connecting onto the A6(T) would also be set back from Hathern village behind existing hillside and proposed woodland planting.

6.5.65 The Development would be well connected to Hathern. Public rights of way would be extended along Hathern Drive and footpath/cycleways would be also be provided along the proposed Strategic Link Road on to the A6(T) to the east of Hathern village. Proposed public footpath routes would also run along the ridgeline by Hathern Hill linking in with an existing footpath which connects to Hathern village.

6.5.66 New areas of open space will be created which will enhance recreational opportunities for Hathern. The main areas of proposed open space will be provided at Hathern Hill (within LCA 3) along the Black Brook corridor (within LCA2) and at Garendon Park (LCA 1). These proposed open spaces would be conveniently accessed off the existing and proposed rights of way.

6.5.67 The proposed GI would enhance the wider setting to Hathern. The magnitude of change to this LCA would be low and result in a minor to negligible beneficial effect.

Landscape Character Area 11: Long Whatton village

6.5.68 Long Whatton lies to the east of the M1 within an agricultural landscape on the southern side of the shallow valley to Long Whatton Brook. Rising ground to the south of the village and Oakley Wood to the south east, along with proposed belts of woodland would prevent any significant

views of the proposed built development. There would be no significant adverse effect upon this area.

Visual Effects

6.5.69 An assessment of the likely visual effects of the Development has been undertaken. Parameters Plans (including, Land Use, Building Heights and Density, Access, Green Infrastructure and Phasing) for the Development have been assessed. The majority of residential development will be at 2 storeys with occasional 2.5 and 3 storey development. Community Hub retail buildings will be up to 3 storeys whilst the primary schools and sports hall would be 1-2 storeys. The proposed employment use buildings would be up to 12m high whilst buildings at the traveller and showman sites would be up to 5m high. An electricity sub-station will include 132KV to 11KV infrastructure including terminal towers and single storey buildings up to 5m high. There would be artificial lighting associated with the proposed residential, employment, Community Hub and primary school developments. Lighting columns would also occur along the Strategic Link Road (outside of Garendon Park) and network of secondary roads and lanes. Within sensitive locations such as within Garendon Park, by the Black Brook, and along Hathern Drive the proposed cycle routes would be lit by low level lighting to minimise the effects of artificial lighting.

6.5.70 Separate appraisals of the effect of the Development upon the historic environment are provided at chapters 7 (Archaeology) and 8 (Cultural Heritage). The following assessment of visual effects takes into consideration the relevant baseline information provided by those chapters. In landscape and visual terms the effects of the Development upon Garendon Park and the setting of its listed buildings and monuments are considered to be of less significance compared to the conclusions reached within the cultural heritage assessment (chapter 8).

6.5.71 A series of representative viewpoints (Ref. Figures 6.6 and 6.7) have been selected to illustrate the varying degrees of visibility across the study area and the potential effect on receptors. Written descriptions are provided alongside each photograph. In addition the assessment includes photographs within the Garendon Park (Ref. Figure 6.8) photomontages (Ref Figure 6.11) and photographs taken at night time (Ref Figure 6.12). Assessment of views from the M1 motorway, Loughborough, Hathern village, Hathern/Shepshed Road, the A6(T) and within Garendon Park are also supported by illustrative cross sections (Ref Figures 6.9 and 6.10). A Schedule of Visual Effects upon residential properties, settlements, roads and public rights of way is provided at Appendix 6.4.

6.5.72 An assessment at year 1 has been undertaken to assess the 'worst case' scenario and includes the effect of construction works. Further detail on the potential construction impacts are described above. For assessment of the visual effects of the completed Development, it has been assumed that there will be fifteen years growth for proposed structural planting. At such time the vegetation will be well established at approximately 10m high.

6.5.73 The Development has a restricted visual envelope owing to the interaction of localised variations in topography, existing vegetation (present along Garendon Park, watercourses, roads, lanes, dismantled railway, hedgerow field boundaries and settlement edges) and existing urban fabric.

Settlement

Loughborough

6.5.74 Views of the Development from the existing residential edge of Loughborough would be very limited. Westerly views from the existing western residential edge of Loughborough (Ref. Figure 6.7 Viewpoints 4 and 5) are largely restricted by a framework of mature woodlands, tree belts and / or landform. Established vegetation cover is present along the edge of Garendon Park, a dismantled railway corridor by the A512(T), Oxley Gutter, Bailey's Plantation and Pear Tree Lane. Consequently the Development would not result in any significant adverse visual effects upon the vast majority of existing properties.

6.5.75 Some properties situated on a localised area of high ground at a recent residential development, to the east of Baileys Plantation, would potentially have partial glimpsed views across the proposed residential roofscape (Ref. Figure 6.7 Viewpoint 8). Potential views would be filtered by the framework of existing and proposed woodlands and tree belts. Such views would be seen within the context of existing residential development situated along the western edge of Loughborough. Minor adverse effects experienced during construction works would reduce to negligible upon completion.

Hathern

6.5.76 Views of the Development from Hathern would be very limited. Landform at Hathern Hill and Bellevue Hill would screen the vast majority of the Development within southerly views from Hathern (Ref. Figure 6.7 Viewpoints 21, 33 and 34). Residential areas of low density proposed along the ridgeline between Bellevue Hill and Hathern Hill would be set back behind a belt of woodland planting. Proposed belts of locally native broadleaved woodland planting along the ridgeline at the northern edge of the Site will effectively screen the proposed built development from Hathern village.

6.5.77 Residential development proposed to the north of Bailey's Plantation and the Strategic Link Road connecting onto the A6(T) would be located to the east of Hathern village and set back behind existing hillside and proposed woodland planting.

6.5.78 Consequently there would be no significant intervisibility between the proposed built development and Hathern village. Partial glimpsed views of upper parts of residential development would be filtered by proposed woodland planting. Minor adverse effects experienced during construction works would reduce to negligible upon completion as the proposed planting establishes.

Shepshed

6.5.79 A combination of localised topography and vegetation occurs within Shepshed's urban fringe and along the M1 corridor. This largely prevents any significant easterly views of the Development from existing residential properties in Shepshed of the Development. Potential distant glimpsed views would be further screened by belts of woodland planting proposed along the M1 corridor. There would be no significant visual effects upon Shepshed.

Long Whatton

6.5.80 Undulating land to the north of Oakley Wood would prevent southerly views of the Development from Long Whatton (Ref. Figure 6.7 Viewpoints 38, 39 and 40). There would be no significant visual effects upon Long Whatton.

Detached Properties

The White Lodge & Temple of Venus (no public access) and Triumphal Arch (no public access) within Garendon Park

6.5.81 The White Lodge (grade II listed), Triumphal Arch (grade I listed) and Temple of Venus (grade II* listed) are situated along a low ridgeline within Garendon Park. The visual impact of the proposed Strategic Link Road, associated traffic and residential development to the north of Garendon Park upon the setting to these buildings has been assessed (Ref. Photoviewpoint Figures 6.8 & 6.11 Viewpoints 1 and 5, Illustrative cross section Figure 6.10, Photomontage Figure 6.11 and Night time photograph Figure 6.12). There would be glimpsed views of the proposed Strategic Link Road and associated traffic through Garendon Park which would be partially screened by a combination of undulating landform and existing vegetation. The proposed junction onto the A512(T) would effectively be screened by existing retained tree belts situated along Shortcliffe Brook and the dismantled railway corridor. Lighting from traffic associated with the Strategic Link Road would be visible at night time. However such views would be seen within the close context of the existing lit highways including the M1, elevated Junction 23 and the A512(T) Ashby New Road. Such views would be filtered by avenues of trees, parkland trees and woodland belts proposed as part of the restoration of Garendon Park. Minor adverse visual effects experienced during construction works of the proposed Strategic Link Road would become beneficial upon completion as a result of the proposed landscape enhancements. Residential development proposed to the north of Garendon Park would largely by screened by existing retained woodlands. Glimpsed distant views of proposed residential Development would not result in a significant adverse visual effect.

The Lodge

6.5.82 This grade II listed detached property is situated within Garendon Park by the existing estate road off the A512(T). The presence of vegetation cover restricts potential views of the proposed Strategic Link Road and its lit junction onto the A512(T) and associated traffic. Retained hedgerow and trees situated along the A512(T), and within the property garden would partially screen the junction onto the A512(T) whilst a mature tree belt along the dismantled railway corridor would screen the Strategic Link Road proposed through Garendon Park. Low level / stud lighting along footpath/cycleway routes proposed along the adjacent estate road and dismantled railway corridor would not result in any significant adverse visual effects. Glimpsed views of the proposed Strategic Link Road junction onto the A512(T) would be seen within the close context of the existing A512(T). Such views would be filtered by woodland belts proposed along the A512(T) corridor. Minor adverse visual effects experienced during construction of the Strategic Link Road would become beneficial upon completion as a result of the proposed landscape enhancements.

The Hermitage

6.5.83 This detached property is situated to the north of Garendon Park by the Hermitage woodland. The presence of vegetation cover partially screens potential views of the proposed residential development. Residential development proposed to the south of the Hermitage would be screened by the existing woodland. Low to medium density residential development proposed to the north of the Hermitage would be set back behind open space and filtered by retained hedgerow and trees situated along the adjacent field boundaries. Moderate adverse visual effects experienced during construction of the proposed Strategic Link Road and residential development would reduce to minor to upon completion.

Red Arch Lodge

6.5.84 This grade II listed building is situated at the northern edge of Garendon Park along with other grade II listed buildings and structures including a barn, farm outbuildings, dovecot and boundary wall. Northerly views across the adjacent arable agricultural fields would be replaced by views of the Development. Low density residential development would be set back from Garendon Park behind a broad corridor of open space along Oxley Gutter. Low level / stud lighting would be installed along the existing cycle route by Oxley Gutter and along a proposed cycle route along Hathern Drive. Existing retained vegetation including tree belts along Hathern Drive and woodlands within the Site, would be supplemented by additional planting which would filter views of the proposed built development and associated lighting. Proposed avenue tree planting would create a vista between the Red Arch Lodge and the proposed Community Hub and sports playing fields. Moderate adverse visual effects experienced during construction of the proposed residential development would become beneficial upon completion as a result of the proposed landscape enhancements.

Pear Tree Cottage

6.5.85 This property is situated adjacent to the Site's north eastern boundary by Pear Tree Lane (Ref. Figure 6.7 Viewpoint 18). Retained hedgerow and trees situated along Pear Tree Lane and within the property garden would filter views of the Development and associated lighting. Northerly views across the adjacent arable agricultural field would be replaced by views of the Development. Medium high density residential development would be set back behind a corridor of open space along Pear Tree Lane. Views of proposed built development would be softened by retained hedgerow and trees situated along the lane along with additional tree planting within the open space. The presence of hedgerow and trees would screen informal open space proposed to the south of Pear Tree Cottage. Moderate adverse visual effects experienced during construction of the proposed Strategic Link Road and residential development would reduce to minor to upon completion.

Dishley Cottage

6.5.86 This semi-detached property is situated opposite the existing residential edge of Loughborough by the A6(T) and Dishley Grange employment site (Ref. Viewpoint 19). The presence of vegetation cover restricts potential views of the proposed lit Strategic Link Road and its junction onto the A6(T). Retained hedgerow and trees situated along the A6(T), and within the property garden would partially screen the junction onto the A6(T). There would be views of residential development along with associated lighting proposed below Bailey's Plantation adjacent to Pear

Tree Lane. Such views would be seen within the context of the A6(T) and existing residential properties at the edge of Loughborough. Moderate to minor adverse visual effects experienced during construction of the proposed Strategic Link Road and residential development would reduce to minor to upon completion.

Lounds Farm

6.5.87 Lounds Farm is accessed off Shepshed Road along a private road (Ref. Figure 6.7 Viewpoint 7). Lounds Farm would retain its immediate agricultural setting on Hathern Hill. Views of the Development within the wider landscape would include residential development to the east of Lounds Farm set back behind retained agricultural land, electricity pylons and proposed open space including Hathern Hill Community Park and allotments. There would also be longer distance views of the Strategic Link Road and mixed use development including employment, retail and residential properties proposed on the opposite side of the Black Brook valley. The Strategic Link Road would potentially become a notable feature within night time views. Trees proposed both along the edge of the Development and elsewhere within the internal areas of green infrastructure would soften the built edge and filter views across the wider development. Belts of woodland planting are proposed to the west of Lounds Farm adjacent to Hathern Road, which would increase local tree cover. Upon completion the proposed built development would be well integrated within the local landscape. Initial moderate adverse visual effects would reduce to minor as tree planting within the proposed green infrastructure establishes.

Bedlam Barn Farm

6.5.88 Bedlam Barn Farm is located to the east of Lounds Farm within the Site (Ref. Figure 6.7 Viewpoint 7). Close range views of the Development along with associated lighting from the farmhouse would be partially restricted by adjacent agricultural sheds and outbuildings. Part of the existing operational area at Bedlam Barn Farm would be replaced by residential development. Existing arable fields to the north, east and south of Bedlam Barn Farm would be replaced by residential development which would result in a loss of open setting. Adjacent land at Hathern Hill is proposed as open space for a community park. Proposed residential development to the south would be set back behind a corridor of open space. Moderate to substantial adverse visual effects experienced during construction of the proposed residential development would reduce to minor moderate upon completion.

Oakley Grange Farm

6.5.89 Oakley Grange Farm is accessed off a private road and set back from Shepshed Road (Ref. Figure 6.7 Viewpoint 35) behind an arable field. Views of the Development from the farmhouse would partially restricted by adjacent agricultural sheds and outbuildings. Existing hedgerows along field boundaries and Shepshed Road would filter long distance views of the Development. Belts of woodland proposed alongside Shepshed Road would largely screen the proposed built development along with associated lighting from view. Minor adverse visual effects experienced during construction works would reduce to negligible as a result of the proposed landscape enhancements.

Shepshed Watermill

6.5.90 This grade II listed detached property is located along Shepshed Road opposite the site (Ref. Figure 6.7 Viewpoint 10). Outbuildings, boundary wall and hedgerow along Shepshed Road

would partially screen views of the Development. There would potentially be close range views of an access road proposed off Shepshed Road and employment development proposed adjacent to Shepshed Road along with associated lighting. Proposed employment buildings would be set back from Shepshed Road behind a belt of woodland planting. There would also be long distance views of the Strategic Link Road crossing the Black Brook, an allotment site and residential development proposed on higher ground by Hathern Hill. Distant views of built development would be softened by existing hedgerows and tree present within the intervening landscape along field boundaries and the Black Brook. Initial moderate adverse visual effects would reduce to minor as tree planting within the proposed green infrastructure establishes.

Public Highways and Rights of Way

M1Motorway

6.5.91 There would be intermittent, easterly views (Ref. Figure 6.7 Viewpoints 27, 28 and 29) of the Development along with associated lighting from embanked stretches of the M1, situated to the north and south of Bunker Hill. There would be views of proposed residential development and the lit Strategic Link Road situated on land adjacent to Bunker Hill and of the proposed employment development situated by the existing recycling centre. Potential views would also include residential development proposed on higher ground by Hathern Hill. In addition there would also be a localised long distance glimpsed view of the proposed Strategic Link Road through Garendon Park from the M1 to the south of Junction 23 (Ref. Figure 6.7 Viewpoint 42). Easterly views of the proposed built development from parts of the M1 corridor are available over existing vegetation planted along the highway embankment and verges. Views of the proposed built development from the M1 would be further softened overtime by belts of woodland planting proposed along the M1 corridor. Potential views of proposed built development from the M1 would be of limited duration. Minor adverse effects experienced during construction works would reduce to negligible upon completion.

A512(T)

6.5.92 Northerly views into Garendon Park from the A512(T) (between M1 Junction 23 and Snells Nook Lane) are partially filtered by tree belts along the disused railway line (Ref. Figure 6.7 Viewpoints 2 and 3). The ridge topped by the Triumphal Arch and the Temple of Venus is an important landmark which forms the near horizon and prevents any wider views further north. There would be localised views of the proposed Strategic Link Road situated between the A512(T) and Home Covert, and also close range views of the proposed lit signalised roundabout junction onto the A512(T). Such views would be seen within the close context of existing highways infrastructure including the lit A512(T), and elevated M1 Junction 23. Low level / stud lighting along footpath/cycleway routes proposed along the adjacent estate road and dismantled railway corridor would not result in any significant adverse visual effects. Minor adverse effects experienced during construction works would become beneficial upon completion as a result of the proposed landscape enhancements, including woodland planting along the A512(T) and avenues of trees proposed as part of the restoration of Garendon Park.

A6(T) (T)

6.5.93 Views of the Development would be limited to a short section of the A6(T) at the edge of Loughborough by Dishley Grange (Ref. Figure 6.7 Viewpoint 19). There would be close range

views of the proposed lit Strategic Link Road and its roundabout junction onto the A6(T). Short sections of hedgerows and a few trees situated along the A6(T) would be required to be removed. However new hedgerow and belts of woodland planting are proposed which would assist in integrating the building development within the local landscape. A balancing pond proposed adjacent to the A6(T)/ Strategic Link Road junction would create an attractive gateway feature into the Development. There would be views of residential development and associated lighting proposed below Bailey's Plantation adjacent to Pear Tree Lane. Such views would be seen within the context of the A6(T) and existing residential properties at the edge of Loughborough. A belt of woodland planting is proposed along the ridgeline between Bellevue Hill and Hathern Hill would ultimately become a notable landscape feature within the view. Moderate to minor adverse visual effects would be experienced during construction of the proposed Strategic Link Road and residential development. Upon completion there would be a minor beneficial visual effect as a result of the landscape enhancements which would result in an increase in tree cover.

Snell's Nook Lane

6.5.94 There would be distant glimpsed views from Snell's Nook Lane (Ref. Figure 6.7 Viewpoint 1) of part of the proposed Strategic Link Road situated between the A512(T) and Home Covert and also of the proposed lit signalised roundabout junction onto the A512(T). Similarly to the above, such glimpsed views would be seen within the context of existing highways infrastructure including the lit A512(T), M1 and elevated M1 Junction 23. Minor adverse to negligible effects experienced during construction works would become beneficial upon completion as a result of the proposed landscape enhancements.

Shepshed Road

6.5.95 A range of views of the Development would occur from a stretch of Shepshed Road situated between the M1 and Hathern Hill (Ref. Figure 6.7 Viewpoints 10, 22, 24 and 36). A combination of existing landform and a proposed woodland belt would prevent any significant views of the Development from Shepshed Road between Hathern Hill and Hathern village (Ref. Figure 6.7 Viewpoints 34 and 35). The M1 motorway forms a visual barrier and prevents any significant views of the development from Shepshed Road by Shepshed.

6.5.96 Low lying fields along the Black Brook flood plain as well as fields by Hathern Hill and Lounds Farm (Ref. Figure 6.7 Viewpoints 10 and 22) would be retained in agricultural use. By the Black Brook flood plain there would be long distance views of residential and employment development, along with associated lighting, partially screened by existing hedgerows situated along Shepshed Road and agricultural field boundaries. Such views would also be filtered by a belt of woodland planting proposed alongside Shepshed Road. Strategic gaps in the woodland would be created to retain key views along the Black Brook and from Hathern Hill.

6.5.97 Close range views of an access road proposed off Shepshed Road and employment development proposed adjacent to Shepshed Road would occur by Shepshed Watermill (Ref. Figure 6.7 Viewpoint 10). Proposed employment buildings would be set back behind a belt of woodland planting. There would also be long distance views of residential development proposed on higher ground by Hathern Hill. Distant views of built development would be softened by existing hedgerows and trees present within the intervening landscape along field boundaries and the Black Brook. Initial moderate adverse visual effects would reduce to minor as tree planting within the proposed green infrastructure establishes.

Public rights of way

6.5.98 There would also be various views across parts of the Development and associated lighting available from the existing public rights of way situated within or immediately adjacent to the Site. These include Butthole Lane (Ref. Figure 6.7 Viewpoints 6 and 14), footpaths by the Hermitage (Ref. Figure 6.7 Viewpoint 13), Oxley Gutter (Ref. Viewpoint 12) and to the north west of Garendon Park (Ref. Figure 6.7 Viewpoint 11), Hathern Drive (Ref. Figure 6.7 Viewpoints 12, 16 and 32), Pear Tree Lane (Ref. Figure 6.7 Viewpoints 16, 17, 18 and 20), a bridleway alongside the Black Brook (Ref. Figure 6.7 Viewpoints 30 and 31) and footpath alongside the M1 (Ref. Figure 6.7 Viewpoint 26).

6.5.99 The majority of notable features along the routes including watercourses, established hedgerows, mature trees and woodland belt would be retained. The context of the routes would alter where built development is proposed nearby and where roads cross over the rights of way. The magnitude of change to such views would be high and during the initial construction works this would result in substantial to moderate adverse visual effects. However, the majority of these routes would be retained within the GI framework and ultimately experience a minor beneficial or negligible effects due to the proposed enhancement of the local landscape, which includes proposed broad corridors of open space.

Butthole Lane, footpath to the north of the Hermitage and by Oxley Gutter

6.5.100 Butthole Lane is an existing byway which forms part of a National Cycle Route between Loughborough and Shepshed (Ref. Figure 6.7 Viewpoints 6 and 14). It links into a footpath to the north of the Hermitage (Ref. Figure 6.7 Viewpoint 13), and a footpath by Oxley Gutter (Ref. Figure 6.7 Viewpoint 12). The cycle route would largely be retained within a green corridor through the Site and is proposed to be lit. Existing trees and hedgerow along the lane would be retained and supplemented with additional tree planting. To the north of Bunker Hill potential close range views of proposed employment development (up to 12m high) would be filtered by retained vegetation. There would also be increased tree cover as a result of the proposed woodland belt alongside the M1. Elsewhere along the route there would also be close range views of the proposed Strategic Link Road and residential development. Proposed GI adjacent to the route includes formal sports pitches, a childrens play area and informal open space. The route would pass through broad corridors of open space adjacent to Garendon Park by Oxley Gutter, with proposed avenues of trees creating vistas between the Red Arch and the Community Hub. The existing complex of listed buildings within Garendon Park adjacent to the route would potentially be restored and used for visitor facilities.

6.5.101 Initial construction works would result in substantial to moderate adverse visual effects. However, upon completion these would reduce to negligible due to the enhancements proposed within the GI network along the route.

Footpath along the eastern edge of Baileys Plantation

6.5.102 This path runs between Pear Tree Lane and the National Cycle Route referred to above. The route includes Stonebow Bridge (grade II listed) which crosses over the Black Brook. The majority of the route is visually enclosed and would be well screened from the Development by mature woodland at Baileys Plantation. To the south of Baileys Plantation an existing hedgerow and tree belt situated alongside the path would be retained within a proposed GI corridor.

Existing retained vegetation would be supplemented with proposed woodland planting belt which would largely screen the residential development proposed to the west. Residential development proposed to the north and south of Baileys Plantation would result in an initial minor adverse visual effect during the construction works. Upon completion the visual effects would reduce to negligible.

Bridleway along Pear Tree Lane

6.5.103 Pear Tree Lane runs along the north eastern edge of the site (Ref. Figure 6.7 Viewpoints 16-20) and would be retained within a corridor of informal open space. Visibility along the route varies depending upon the degree of enclosure provided by localised topography at Bellevue Hill and vegetation cover including hedgerow, tree belt and Baileys Plantation. There would be localised views of residential development and the Strategic Link Road proposed within the adjacent fields situated to the north of Pear Tree Lane. Existing trees and hedgerow along the lane would be retained and supplemented with additional tree planting. Relatively close range views of the Development would be set back behind open space and filtered by trees and hedgerow. Initial construction works would result in substantial to moderate adverse visual effects reducing to minor adverse or negligible upon completion.

Bridleway to the west of Hathern Drive & Pear Tree Lane

6.5.104 Two sections of an existing bridleway (Ref. Figure 6.7 Viewpoints 30,31 & 24) would be diverted as a result of the Development and Strategic Link Road. The route would be diverted close to the existing route along 'Garendon Common' – a major corridor of open space which would run through the core of the Site along the Black Brook connecting Loughborough's existing urban edge to the surrounding countryside. Garendon Common will include areas for informal recreation, wildlife enhancement and SUDs attenuation areas. The proposed diversion due to the new Blackbrook bridge will include a controlled Pegasus crossing across the Strategic Link Road. Northerly views from the bridleway would include residential development and an allotment site set back behind open space. To the south there would be longer distance views across Garendon Common towards the Community Hub, including retail development, a primary school and sports hall building. Views of the proposed built development would be filtered by existing vegetation along the Black Brook. There would also be views of the proposed Strategic Link Road and vehicular bridge crossing the Black Brook. The proposed bridge has been designed as a low level structure which would minimise disruption upon views whilst avenue planting would assist in filtering views of the Strategic Link Road.

6.5.105 There would also be southerly views of proposed employment development and access road from the existing bridleway situated to the west of the proposed Strategic Link Road. Views towards the Development would be across fields retained in agricultural use, and partially screened by existing tree belts and hedgerows along the Black Brook corridor.

6.5.106 Initial construction works would result in substantial to moderate adverse visual effects. However, upon completion there would be minor beneficial visual effect due to the proposed enhancements along the Black Brook corridor.

Footpath adjacent to the M1

6.5.107 The existing footpath runs along the Site boundary at the foot of the M1 embankment, between Butthole Lane and Shepshed Road. Existing easterly views over an arable field towards the

sewage works and recycling facility would be replaced by the Development. Proposed employment development would become screened overtime by a belt of woodland planting proposed adjacent to the M1. Initial minor adverse visual effects would reduce to negligible upon completion.

Footpath on Hathern Hill situated between Hathern and Shepshed Road

6.5.108 Existing views from the footpath by Hathern village are largely restricted by Hathern Hill (Ref. Figure 6.7 Viewpoint 33) and the Development would not result in a significant adverse effect. Longer distance views across the Development would be available from a locally elevated vantage point on Hathern Hill (Ref. Figure 6.7 Viewpoint 23). Low density residential development proposed within the adjacent fields would be visible, set back from the footpath on lower ground, behind a broad belt of woodland planting. Initial substantial moderate adverse visual effects experienced during construction would reduce to negligible upon completion as the proposed woodland planting establishes.

6.6 Cumulative Assessment

6.6.1 This section assesses the likely significant effects of this Development when considered in the context of other future projects. There are a number of future developments proposed around Loughborough including:

- Loughborough University Science and Enterprise Park;
- Biffa Waste Incinerator scheme;
- Dishley Grange Employment; and
- Off-site highway improvements / Ashby Road widening.

Loughborough University and Science and Enterprise Park

6.6.2 CBC's emerging Core Strategy allocates an extension to the west of the University Science and Enterprise Park. The University Science and Enterprise Park would accommodate a range of developments. Subject to future demand these could include start-ups, small units and shared facilities as well as larger scale buildings for technology based firms from the region, larger corporate companies with research and development related projects from other parts of the UK, and other new University related research and development projects.

6.6.3 The landscape to the west of the University provides an attractive approach to Loughborough. This area forms the north-eastern part of Charnwood Forest Regional Park together with the National Forest.

6.6.4 In accordance with the emerging Core Strategy the landscape will need to be planned to create and improve habitats, reflecting the established character. Early phases of the Science and Enterprise Park have maintained a parkland setting by retaining 40% of the development site as open and undeveloped. It is likely that the future extension to the Science and Enterprise Park would continue to be developed in a landscaped parkland setting. The development's scale, form, character and design will be required to respect the site's topography, natural features and setting. As a gateway to Loughborough, the University Science and Enterprise Park provides an opportunity to provide landmark buildings on prominent frontages in support of the Core Strategy

vision for high quality design. Therefore the potential University Science and Enterprise Park would be unlikely to cause any significant adverse effects.

6.6.5 The effects of the West of Loughborough SUE, when considered in the context of the envisaged Science and Enterprise Park would not result in a significant cumulative adverse effect upon the local landscape and visual resource.

Biffa Waste Incinerator scheme

6.6.6 Permission was granted on appeal in 2012 for an incinerator at the Newhurst Quarry site, Shepshed, located to the south of Ashby Road A512(T) and west of M1 Junction 23 (Application Ref 2009/2497/02 (2009/C166/02). The approved scheme has not been implemented and revised plans are expected to be submitted during 2014.

6.6.7 The Inspector's recommendation acknowledged that the proposed incinerator would result in a localised landscape effect and would have some urbanising impact. With regard to visual intrusiveness within panoramic views where the incinerator would occur these would be mostly result in slight to moderate adverse effects.

6.6.8 Part of the mitigation for the incinerator scheme proposed to re-create the former geometric tree-lined avenues in the south western portion of Garendon Park and undertaking the repair and restoration of the Temple of Venus and the Triumphal Arch. Given the proposed mitigation the Inspector agreed with English Heritage's assessment that the impact upon heritage assets would be less than substantial and that there would be a benefit to the designated heritage assets by returning a level of authenticity to the planting arrangement and setting of the buildings.

6.6.9 As part of the West of Loughborough SUE development, Garendon Park would be restored in a manner which reflects the original 1777 Estate Map. It includes tree lined avenues proposed within the southern part of Garendon Park which would connect the Triumphal Arch, Temple of Venus and the White Lodge. Principles for the restoration have been agreed with English Heritage and are consistent with the mitigation proposed for the approved incinerator scheme.

6.6.10 The effects of the SUE, when considered in the context of the incinerator scheme would not result in a significant adverse cumulative effect upon the local landscape and visual resource.

Dishley Grange Employment Site

6.6.11 The Dishley Grange site adjoins Loughborough's established Bishop Meadow Industrial Park on the northern fringes of the town, with convenient access off a new roundabout junction on the A6(T). The site is allocated within the CBC's emerging Core Strategy and is planned for B1/B2/B8 industrial, warehouse and office purposes.

6.6.12 Dishley Grange employment development will be required to include substantial landscaping within the employment site to fragment the overall mass of the development. Belts of woodland planting and landscaping to a minimum depth of 20 metres will be provided to screen the development from important views and safeguard the setting of Dishley Grange. The development would also include the provision of replacement and improved playing field provision including changing rooms and associated parking facilities.

6.6.13 The effects of the SUE, when considered in the context of the Dishley Grange Employment site would not result in a significant cumulative adverse effect upon the local landscape and visual resource.

Off-site highway improvements

6.6.14 A range of potential off-site highway improvements have been identified to accommodate future development proposed within Loughborough. Potential highways improvement works include widening of various stretches of highway and junctions as a result of the cumulative impact of increased traffic. The potential works would be largely contained within the limits of the current highway land and adopted carriageway. As such the removal of trees and hedgerows will be limited, with the area affected most being the Ashby Road A512(T) widening between the M1 Junction 23 and Snell's Nook Lane. Details of the proposed A512(T) Site Access and M1 Junction 23 / A512(T) Dualling Proposals are provided within the Transport Assessment at Figure 8. Belts of existing tree planting occur on the roadside embankments the A512(T) leading to the elevated M1 Junction 23. The existing planting belts taper down to a roadside hedgerow with occasional trees on the approach to Snell's Nook Lane.

6.6.15 There would be temporary adverse landscape and visual effects caused by the off-site highway works during the construction phase which would require the removal of existing vegetation including roadside grass verge, hedgerow, hedgerow trees and tree belt. Vegetation losses would be greater along the southern edge of the A512(T) and include roadside hedgerow, hedgerow trees and a section of the embankment planting. Vegetation losses along the northern edge would affect the fringe of the embankment planting and localised section of hedgerow. However the potential works would be required to include mitigation in order to reduce any otherwise significant adverse landscape and visual effects. Replacement planting of hedgerows and tree belts would recreate a robust, well vegetated corridor along the dualled A512(T) at the western edge of Loughborough. Therefore the potential off-site highway improvements taken with such measures would be unlikely to cause any significant adverse effects.

6.6.16 Other cumulative landscape and visual effects involving the 'committed' developments are unlikely to be significant. Localised topography, existing vegetation and urban fabric limits any significant inter-visibility between the Development and the wider landscape within which other 'committed' developments occur.

6.7 Summary

6.7.1 The Development would create a sustainable mixed-use urban extension on land situated to the west of Loughborough. This assessment indicates that the Development would ultimately result in a range of beneficial impacts upon the landscape and visual resources. Summary tables of landscape character and visual effects are provided at Appendices 6.3 and 6.4. The proposed GI framework would ensure the protection and enhancement of existing features of value. Potential substantial or moderate adverse impacts occurring during the particular phases of construction works would be restricted to localised areas situated within or immediately adjacent to the Site. However, the completed Development would not result in permanent substantial or moderate adverse impacts. Indeed there would be a range of long term beneficial impacts.

Landscape Effects

6.7.2 The Development would create a substantial GI resource within which there would be a range of enhancements. The proposed GI addresses Natural England's key environmental opportunities identified for the 'Melbourne Parklands' and 'Charnwood' Character Areas.

6.7.3 As part of the Development, Garendon Park would be restored in a manner which reflects the original 1777 Estate Map. Principles for the restoration and future management have been agreed with English Heritage. As the proposed avenues of trees establish, there would be a permanent enhancement to Garendon Park (Character Area 1) which would result in a moderate beneficial effect. The proposed Strategic Link Road has been carefully designed following consultation with English Heritage. Adverse effects upon Garendon Park would be limited to a localised area adjacent to existing the A512(T), M1 and elevated M1 Junction 23 and would not be significant.

6.7.4 The majority of the Development occurs within an agricultural landscape (Character Areas 2 and 3) within which there would be minor beneficial impacts. Within the Black Brook Vale (Character Area 2) a major corridor of open space will run through the core of the site along the Black Brook connecting Loughborough's existing urban edge to the surrounding countryside. 'Garendon Common' would be created within the central part of the Black Brook corridor alongside the Community Hub and would become a focus for the new community. The proposed GI corridors would permeate through the new neighbourhood which will create a fragmented edge to the built development particularly within those areas adjacent to Garendon Park. Proposed low density residential development will be set back from the edge of Garendon Park behind wide landscape buffers. Proposed avenues of trees will create key vistas through the Development and create strong links between Garendon Park and the new neighbourhood.

6.7.5 Within Hathern Hill (Character Area 3) existing features of value including rights of way, tree belts, field hedges, and upper slopes by Hathern Hill and Bellevue Hill would largely be retained and protected within the proposed GI. These retained features form the framework for linked GI corridors and provide further opportunities for enhancements including recreation, habitat creation and SUDs. The main GI corridors within this area will run along the northern edge of the development retaining a continuous green buffer to Hathern, and to the west of the site creating a green buffer along Hathern Road. A community park is proposed on Hathern Hill which will provide a focal area of public open space.

6.7.6 The comprehensive GI proposals would have a range of other beneficial effects. Within the northern part of the Site, increased tree cover would result in a beneficial effect upon Hathern's agricultural fringe (Character Area 4) whilst the landscape enhancements proposed along the M1 corridor, Hathern Road and the A512(T) will have a beneficial effect upon Shepshed's urban fringe (Character Area 6), and Loughborough's urban fringe (Character Area 7).

Visual Effects

6.7.7 The Development has a restricted visual envelope owing to the interaction of localised variations in topography, existing vegetation (present along Garendon Park, watercourses, roads, lanes, dismantled railway, hedgerow field boundaries and settlement edges) and existing urban fabric.

6.7.8 Views of the Development from the existing residential edge of Loughborough would be screened by the framework of mature woodlands and tree belts present along the edge of Garendon Park,

the dismantled railway corridor, Oxley Gutter, Bailey's Plantation and Pear Tree Lane. Consequently the Development would not result in any significant adverse visual effects upon the vast majority of existing properties.

6.7.9 Views of the Development from Hathern would be restricted by landform at Hathern Hill and Bellevue Hill. Residential areas of low density proposed along the ridgeline between Bellevue Hill and Hathern Hill would be set back behind belts woodland planting, resulting in negligible upon visual effect upon completion as the proposed planting establishes.

6.7.10 A combination of localised topography and vegetation occurs within Shepshed's urban fringe and along the M1 corridor. Potential distant glimpsed views would be further screened by belts of woodland planting proposed along the M1 corridor. There would be no significant visual effects upon Shepshed.

6.7.11 The White Lodge (grade II listed), Triumphal Arch (grade I listed) and Temple of Venus (grade II* listed) are situated along a low ridgeline within Garendon Park. The visual impact of the proposed Strategic Link Road and residential development to the north of Garendon Park upon the setting to these buildings has been assessed. Potential views of the proposed Strategic Link Road and its associated traffic would be seen within the context of glimpsed views of the M1 and the A512(T). Such views would be filtered by avenues of trees, parkland trees and woodland belts proposed as part of the restoration of Garendon Park. Visual effects would become beneficial upon completion as a result of the proposed landscape enhancements.

6.7.12 The Red Arch Lodge (grade II listed) is situated at the northern edge of Garendon Park along with other grade II listed buildings and structures including a barn, farm outbuildings and dovecot. Northerly views across the adjacent arable agricultural fields would be replaced by views of the Development. Residential development would be set back from Garendon Park behind open space. Existing retained vegetation including tree belts woodlands would be supplemented by additional planting. Proposed avenue tree planting would create a vista between the Red Arch Lodge and the proposed Community Hub and sports playing fields. Moderate adverse visual effects experienced during construction of the proposed residential development would become beneficial upon completion as a result of the proposed landscape enhancements.

6.7.13 There are a few other detached properties situated adjacent to or within the Site including Pear Tree Cottage, Dishley Cottage, Lounds Farm, Bedlam Barn Farm and Shepshed Watermill. These would experience relatively close range views of residential development and access roads. Moderate or substantial adverse impacts experienced during construction would reduce to minor adverse upon completion.

6.7.14 A range of views of the Development would occur from the existing roads, footpaths and bridleways situated within or immediately adjacent to the Site. Initial construction works would result in minor to moderate adverse visual effects upon the M1, A512(T), A6(T) and Shepshed Road and Snell's Nook Lane. However the majority of views from these routes would ultimately experience minor beneficial impacts due to the proposed enhancement of the local landscape, which includes belts of woodland planting and avenues of trees proposed within broad corridors of open space created as part of a high quality GI framework.

6.7.15 Views across parts of the Development are available from the existing public rights of way situated within or immediately adjacent to the Site include Butthole Lane, footpaths by the

Hermitage, Oxley Gutter and to the north west of Garendon Park, Hathern Drive, Pear Tree Lane, a bridleway alongside the Black Brook and footpath alongside the M1.

6.7.16 The majority of notable features along these routes including watercourses, established hedgerows, mature trees and woodland belt would be retained. The context of the routes would alter where built development is proposed nearby and where roads cross over the rights of way. During the initial construction works this would result in substantial to moderate adverse visual effects. However, the majority of these routes would be retained within the GI framework and ultimately experience a minor beneficial or negligible effects due to the proposed enhancement of the local landscape.

7 ARCHAEOLOGY

7.1 Introduction

7.1.1 This Chapter, prepared by CgMs Consulting Ltd, details the likely receptors and effects of the Development in terms of the buried archaeological resource. It describes the baseline conditions at the Site and its surrounding area and examines the likely significant environmental effects and mitigation measures required to offset any significant adverse effects. It also considers the likely residual effects after these measures have been employed.

7.1.2 This Chapter is supported by the following technical appendices:

Appendix 7.1 – Archaeological Desk Based Assessment;

Appendix 7.2 – Aerial Photographic Survey; and

Appendix 7.3 –Geophysical Survey.

Scope of the Assessment

7.1.3 The aim of this assessment, as outlined in the ES Scoping Report (February 2014) is to define and assess the likely significant archaeological effects of the Development. The ES Scoping Report identified the baseline surveys that would be needed to inform the ES as being the desk based assessment produced in 2013, an aerial photographic survey of the Site and a detailed geophysical survey of the Site. These surveys have been completed and are presented as technical appendices 7.1 – 7.3.

7.1.4 The ES Scoping Report also stated that the results of the initial three baseline surveys would inform the need for further baseline information to be obtained by trial trench evaluation. The surveys do indicate that trial trench evaluation should be undertaken. A trench plan has been agreed with Charnwood Borough Council and it is intended to undertake the trial trenching in September/October 2014, prior to the determination of the application, and present the results as an addendum to this ES.

The Development

7.1.5 This Chapter should be read in conjunction with the Site description and the description of the Development as set out in Chapter 1 and Chapter 2 of this ES.

7.1.6 The Site consists of primarily arable agriculture and areas of horse grazing. Areas of woodland are present, particularly in the south of the Site, which is site of the historic Garendon Park. Garendon Park also includes some areas of cattle grazed pasture, a lake (known as Red Lake) and a number of historical buildings. The Black Brook runs west to east across the Site, separating the northern section from the central area and Garendon Park in the south. A smaller stream, the Shortcliff Brook, is also present in the south of the Site.

7.1.7 The Development is set out in section 2.1 and in summary will include:

- Up to 3,200 residential dwellings; and

- Up to 16ha of commercial development (B1, B2 & B8).

7.1.8 These will be constructed within the northern and central sections of the Site; the historic Garendon Park being retained and restored for public use. Existing buildings within the Park will be used to provide the necessary visitor facilities.

7.1.9 The Development will be served by a new Strategic Link Road that will provide access from the A512(T) New Ashby Road in the south and the A6(T) in the north-east, with a link to the B588 Hathern Road in the north-west.

7.2 Policy Context

National Policy

7.2.1 In March 2012, the Government published the National Planning Policy Framework (NPPF), which replaces previous national policy relating to heritage and archaeology (Planning Policy Statement (PPS)5: Planning for the Historic Environment (2010)).

7.2.2 On 6 March 2014 the Government published its national Planning Practice Guidance (PPG) to complement the NPPF. The PPG is a web-based set of guidance notes covering 41 topic areas, flexible to be updated accordingly. The purpose of the guidance is to clarify statements made in the NPPF. As such both sets of information should be read together

7.2.3 Section 12 of the NPPF, entitled 'Conserving and enhancing the historic environment' provides guidance for Local Planning Authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 12 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development;
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
- Conservation of England's heritage assets in a manner appropriate to their significance; and
- Recognition of the value that heritage makes to our knowledge and understanding of the past.

7.2.4 Section 12 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 128 states that planning decisions should be based on the significance of the heritage asset, and that the level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential effect of the proposal upon the significance of that asset.

7.2.5 Heritage assets are defined in Annex 2 of the NPPF as:

> *"A building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions because of its heritage interest. Heritage asset includes designated heritage assets and assets identified by the Local Planning Authority (including local listing)."*

7.2.6 They include designated heritage assets (as defined in the NPPF) and assets identified by the Local Planning Authority.

7.2.7 Annex 2 also defines archaeological interest as:

> *"There will be archaeological interest in a heritage asset if it holds or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them."*

7.2.8 A designated heritage asset comprises a:

> *"World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation."*

7.2.9 Significance is defined as:

> *"The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting."*

7.2.10 In short, Government policy provides a framework which:

- Protects nationally important designated heritage assets (which comprise World Heritage Sites, Scheduled Ancient Monuments, Listed Buildings, Protected Wreck Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas);
- Protects the settings of such designations;
- In appropriate circumstances seeks adequate information (from desk-based assessment and where necessary field evaluation) to enable informed decisions; and
- Provides for the excavation and investigation of sites not significant enough to merit in-situ preservation.

7.2.11 In considering any planning application for development, the Local Planning Authority must have regard to the framework set by Government policy, in this instance the NPPF and PPG, by current and emerging Development plan policy, and by other material considerations.

Local Policy

7.2.12 The Development Plan for Charnwood formerly comprised the Borough of Charnwood Local Plan (adopted 2004). Following Directions from the Secretary of State in September 2007 on the retention of existing Development Plan policies, only one of the two policies in the Charnwood Local Plan relating to treatment of archaeological issues, Policy ENV2 (relating to nationally important archaeological sites), has been 'saved' until it is replaced in the new Local Plan.

"Policy ENV/2: Nationally Important Archaeological Sites

Planning permission will not be granted for development which would adversely affect a Scheduled Ancient Monument or other nationally important archaeological site, or its setting."

7.2.13 Policy EV3, which related to Archaeological Sites of County and Local Significance, was not saved on the grounds that it was contrary to national policy.

7.2.14 Therefore in considering the heritage implications of any planning application for development, the Local Planning Authority will be guided by the policy framework set by Government policy, the saved Local Plan Policy ENV/2 and by Policy CS14 of the Charnwood Local Plan 2006-2028 - Core Strategy Submission Draft.

7.3 Assessment Methodology

7.3.1 This assessment is based on the requirements of the NPPF. Reference has also been made to the Department of the Environment (DoE) Good Practice Guide 'Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment'. It is in accordance with current best archaeological practice and the appropriate national standards and guidelines, including; Management of Archaeological Projects (English Heritage 1991); Code of Conduct (Institute of Field Archaeologists 2000); Standards and Guidance for Archaeological Desk Based Assessment (Institute of Field Archaeologists 2001); The Setting of Heritage Assets (English Heritage 2011); Historic Environment Good practice Advice Notes (consultation draft) (English Heritage 2014); and Planning Practice Guidance (DCLG 2014).

7.3.2 The assessment takes into account the importance of the heritage assets and the likely effect upon them to arrive at a judgement of the significance of the effect of the scheme. A three step process has been applied.

Importance

7.3.3 At the time of submission of the application form, there is no nationally agreed method of measuring the relative importance of archaeological monuments. It is, however, possible to distinguish between monuments of very high, high, medium, low and negligible importance/sensitivity (Table 7.1).

Table 7.1 Definitions of Importance

Importance	Definition
High	Monuments that are scheduled and protected under the Ancient Monuments and Archaeological Areas Act (1979), or archaeological sites and remains of comparable quality, assessed with reference to the Secretary of State's non-statutory criteria.

Medium	Archaeological sites and remains which, while not of national importance, score well against most of the Secretary of State's criteria
Low	Archaeological sites that score less well against the Secretary of State's criteria.
Negligible	Areas in which investigative techniques have produced negative or minimal evidence of antiquity, or where large-scale destruction of deposits has taken place (e.g. by mineral extraction).

Magnitude of Change

7.3.4 Change can arise as a result of construction on below ground archaeological remains. Change can also affect the setting of a heritage asset caused by the proximity of new structures, noise or dust. Such changes can be adverse or beneficial, temporary or permanent, reversible or irreversible. The magnitude of the change will be considered in terms of substantial, moderate, minor or negligible, as set out in Table 7.2.

Table 7.2 Definition of Magnitude of Change

Magnitude of Change	Definition
Substantial adverse	Total loss or substantial harm to the significance of the heritage asset either directly or through effects upon its setting.
Moderate adverse	Significant harm to the significance of the heritage asset either directly or through effects upon its setting.
Slight adverse	Minor negative impacts upon the significance of the heritage asset either directly or through effects upon its setting.
Negligible	Imperceptible impact upon the archaeological remains or their setting.
Slight beneficial	Re-introduce accessibility to archaeological remains; and/or improve setting of an asset.
Moderate beneficial	Proposals would reduce rate of current degradation: improve setting of visible assets; and/or enhance existing character.

Magnitude of Change	Definition
Substantial beneficial	Proposals would prevent further degradation of the asset and be consistent with their long term preservation; would increase accessibility and understanding of visible assets by removal of visibly intrusive elements.

Significance

7.3.5 The significance of change to a resource falls into one of four categories:

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

7.3.6 Defining the significance of the change seeks to take account of the magnitude of change and the relative importance of the receptor, as indicated in Table 7.3.

Table 7.3 Defining the Significance of Change

Importance of resource	Magnitude of Change			
	Substantial	**Moderate**	**Slight**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible

Baseline Data Collection

7.3.7 This assessment has been based on the findings of three archaeological surveys. An archaeological desk based assessment (Appendix 7.1), conducted in September 2013. The assessment compiled information on the historic environment primarily from the Leicestershire and Rutland Historic Environment Record, from English Heritage databases and from information held by the Leicestershire Record Office. The archaeological desk based assessment has been

augmented by an aerial photographic assessment undertaken in November 2013 (Appendix 7.2) and a geophysical survey undertaken between January and May 2014 (Appendix 7.3).

Limitations

7.3.8 No intrusive archaeological evaluation has yet been undertaken in order to fully appraise the date, function and state of preservation of any archaeological remains identified. It is currently proposed to undertake the trial trench evaluation in September/October 2014. The Results of the trial trench evaluation will be presented as an addendum to the Environmental Statement.

7.4 Baseline Conditions

7.4.1 Technical Appendix 7.1 provides a detailed description of all known archaeological records both within the Site and the surrounding area. The following section summarises the findings of that report.

7.4.2 Data obtained from the Local Planning Authority and English Heritage confirms that the Site contains the Scheduled Ancient Monument of Garendon Abbey, Garendon Park which is included on the English Heritage Register of Historic Parks and Gardens at grade II and 15 Listed Buildings (1 grade I, 1 grade II* and 13 grade II). The potential effects of Development upon these designated heritage assets is considered in detail in Chapter 8 of this ES.

7.4.3 The Leicestershire and Rutland Historic Environment Record lists 31 archaeological sites within the Site itself and a further 62 sites within a 500m search area surrounding the Site. Of the 31 sites falling within the Site 19 fall within the bounds of Garendon Park and will not be subject to any direct impact.

7.4.4 The Archaeological Desk-Based Assessment (Appendix 7.1) considered the Site as having a moderate to high potential for significant activity dating to the Prehistoric and Roman periods. A reasonably uniform potential for low density flint scatters of earlier Prehistoric date and settlement and field systems of Iron Age and Roman date exists across the Site. The potential for significant remains dating to the Saxon, Medieval and later periods is confined to areas of Garendon Park that will not be impacted by the Development.

Prehistoric

7.4.5 Finds of Palaeolithic, Mesolithic, Neolithic and Bronze Age flint scatters are recorded from within the Site itself (predominantly in the west). Low levels of Iron Age artefacts, including metal work and pottery, have been recovered from two locations in the west and north-east of the Site. Two possible Iron Age sites are recorded on the Historic Environment Record (HER) from within Garendon Park. Both sites are recorded from cropmark evidence, although the recent aerial photographic survey undertaken as part of this assessment has cast doubt on the archaeological origins of at least one of these sites (Appendix 7.2 pg. 5-6).

7.4.6 The geophysical survey (Appendix 7.3) has identified two features which, on morphological grounds, may be of Prehistoric date. A ring ditch, measuring approximately 25m in diameter, has been recorded in the north-eastern part of the Site (site 1, Figure 7.1). This feature possibly represents a ploughed out Bronze Age round barrow. A small double enclosure has been identified within the north-western part of the Site to the South-east of Lounds Farm (site 3, Figure 7.1). The nature and date of this feature is not clear from geophysical survey alone

although on morphological grounds it is considered likely to be of Iron Age date and represent a small farmstead or stock enclosure.

Roman

7.4.7 A substantial scatter of Roman pottery, flue tiles and tesserae suggesting evidence of a probable Roman Villa with hypocaust and mosaic is recorded to the north of the Black Brook, just beyond the north-western edge of the Site. Four small trial pits were excavated by a local archaeological fieldwork group in 2000 revealed a plaster/opus signinum deposit at a depth of c400mm which supports the theory of the presence of a high status Roman building. Geophysical survey of this area (Appendix 7.3) has identified the presence of a sub-rectangular enclosure containing internal features which extends to within the Site (site 4, Figure 7.1). Whilst the geophysical survey does confirm the presence of archaeological features it has not identified anything that could be positively interpreted as a building. Site 5 (Figure 7.1) shows more ephemeral ditches that possibly represent associated stock enclosures or field systems associated and two areas of burning possibly related to kilns or furnaces.

7.4.8 A second possible Roman settlement site has been postulated by the HER in the north-eastern part of the Site where a number of Roman metalwork objects have been found by metal detecting. These finds comprise two brooches and a cosmetic implement, it is therefore a little unclear as to why the HER classify the record as a possible settlement site as such finds can also be the product of casual loss. Geophysical survey in this area has not identified any potential settlement remains (Appendix 7.3).

Saxon

7.4.9 The Archaeological Desk Based Assessment identified a high potential for significant Saxon-Medieval activity. A small hamlet is thought to have been located in the environs of the later Garendon Abbey site (within the current northern boundary of the Park). Cropmarks of rectilinear features found within Garendon Park have been identified by both the HER and the recent aerial photographic survey, as possible evidence of the late Anglo Saxon/Early Medieval Garendon village that was abandoned in 1133 when the Cistercian Abbey was founded.

7.4.10 Possible Saxon field systems were identified from aerial photographs by the Loughborough and District Archaeological Society to the north of the Park boundary, south of Black Brook, although no evidence for these remains was identified by the recent aerial photographic survey.

7.4.11 A single find of Anglo Saxon date is recorded from within the Site; part of an Anglo-Saxon brooch found during metal detecting in the north-eastern part of the Site. A single find such as this could easily have come from casual loss and is not necessarily indicative of settlement or other activity in the immediate vicinity.

7.4.12 It is likely that most of the Site was occupied by pasture or woodland during the early Anglo Saxon period and is thus of little or no potential. The presence of a Saxon hamlet is possible within Garendon Park, although it falls within an area that will not be impacted by the Development.

7.4.13 Geophysical survey has not identified any features of potential Saxon origin (Appendix 7.3).

Medieval

7.4.14 Records of Medieval activity within the Site are firmly focused on that part of the Site that falls within Garendon Park.

7.4.15 Within the northern boundary of Garendon Park, on the site of the Post-Medieval Garendon Hall, a Medieval Cistercian Abbey was founded in 1133. The foundation walls of part of the Abbey complex were excavated in the 1960s where it was revealed that the western portion of the Abbey and the Dorter range was overlain by the Post-Medieval Garendon Hall. Parts of the Chapel and Chapter House were also excavated and burials revealed. Extensive earthworks of former fishponds survive and the layouts of most buildings have been uncovered. Lengths of large ditches surviving as earthworks to the east of the Abbey complex are assumed to be the precinct boundary. The Abbey site is now a Scheduled Ancient Monument (SAM 17099). Just outside the north-western corner of the Site a Medieval Watermill associated with the Abbey is recorded on the Black Brook. Water from this mill was diverted to the Abbey along a banked watercourse to a large pool to the north-west of the Abbey. Water from this pool was then released into a fishpond, north-east of the Abbey, which was subsequently filled in and ploughed over. To the north of the Abbey, monastic farm buildings, the remains of which have been incorporated into later, surviving buildings, are recorded.

7.4.16 Garendon Abbey is believed to lie within Medieval Parkland and a Park certainly existed at Garendon by the early Post-Medieval period. The archaeological potential is therefore considered to be moderate for evidence of a late Medieval/Post-Medieval Park Pale. The exact location of the Medieval/Post-Medieval Park limits are not known but are assumed to lie within the southern part of the Site covered by the current Park.

7.4.17 Beyond the bounds of the current Registered Park lies Stonebow Bridge which crosses the Black Brook along Stonebow Walk, to the north of the Abbey, is most likely of Medieval origins. Otherwise Medieval activity beyond the bounds of the Park is considered to be limited to evidence of Medieval agricultural practices in the form of ploughed out ridge and furrow earthworks.

7.4.18 English Heritage have flagged up the potential for an early foundation of the Abbey to be located in the area of Hermitage Plantation. This is based on the writings of a 19th century antiquarian who suggested the name of 'Hermitage' may suggest the presence of an early foundation of the Abbey or the location of a Medieval Hermitage associated with the Abbey. However, it could also be the case that the name relates to a lost eighteenth century parkland feature. To date there is no archaeological evidence to support any of these hypothesis. Geophysical survey has been conducted along the northern edge of the Hermitage Plantation (the southern side of the plantation is occupied by game bird breeding pens and as such was not suitable for survey). The geophysical survey identified a series of weak anomalies that seem to form a sub-rectangular enclosure to the north of the eastern end of Hermitage Plantation (site 2, Figure 7.1) but there is nothing to suggest these are of Medieval origin.

7.4.19 Geophysical survey has confirmed the widespread presence of ploughed out ridge and furrow across the Site but has not identified any other features of potential Medieval date (Appendix 7.3).

Post-Medieval & Modern

7.4.20 The heritage potential of the Post-Medieval and Modern periods relates mainly to the Registered Historic Park and Garden. Although some elements of Post-Medieval hedged fields survive, the original patterns have been much altered by post-war hedge removal. The geophysical survey has identified may former field boundaries shown on historic mapping. The HER and aerial photographic survey record the locations of two Second World War prisoner of war camps within the Site, one within the Registered Park and a second in the east near to Pear Tree Lane.

Summary of archaeological potential and importance

7.4.21 The assessment of impacts upon all designated heritage assets are considered in Chapter 8. No recorded archaeological remains within the Registered Park will be subject to any direct impact and will therefore not be considered any further within this Chapter. Any issues regarding impacts upon the settings of these remains are covered by the assessment of impact on the setting of the Registered Park presented in Chapter 8 of this ES.

7.4.22 Geophysical survey has identified five foci of archaeological activity (sites 1-5, Figure 7.1). The significance of these remains is derived from their archaeological interest. The possible Bronze Age barrow (site 1), the possible Iron Age enclosure (site 3) and the possible Roman field systems and kilns/furnaces (site 5) are considered to be of Low to Medium Importance, depending upon their state of preservation. Site 4, the potential high status Roman building, is considered to be of Medium to High Importance, again depending upon nature and state of preservation. Site 2 is currently of unknown nature and Importance.

7.4.23 The geophysical survey has identified a number of anomalies, scattered across the Site, that are of uncertain origin. It is likely that the majority of these are of natural origin, although there is a moderate potential for them to be of archaeological origin. The significance of these remains, if present, would be derived from their archaeological interest and are likely to be of Low to Medium importance.

7.4.24 Should the area around Hermitage Plantation (including Site 2) prove to contain remains of an early foundation of Garendon Abbey and/or an associated Medieval Hermitage these are likely to be of High Importance due to their associations with the Scheduled Abbey. However, on current evidence it is considered unlikely that any such remains will be found to be present.

7.5 Potential Effects

7.5.1 This section considers the potential impact from construction and operation of the Development. The assessment of potential impacts has been made with reference to the description of Development and the illustrative Masterplan (Chapter 2, Appendix 1.1).

7.5.2 The only significant below ground impact of development within the Registered Park is confined to the route of the proposed Strategic Link Road.

Construction Phase

7.5.3 The primary impact of construction works will be from groundwork associated with the Development directly impacting upon the archaeological resource. Any potential archaeological remains within the areas affected by the groundworks are potentially subject to direct impact

during development. This impact is likely to result in substantial or total destruction of archaeological remains which is considered a permanent, substantial adverse impact.

7.5.4 The only significant below ground impact of development within the Registered Garendon Park is confined to the route of the proposed Strategic Link Road. No significant archaeological remains have been identified along the route of the Strategic Link Road.

7.5.5 The baseline conditions and assessment outlined above have, to date, identified five sites of archaeological significance within the Site that are sensitive to development proposals.

7.5.6 Three of the five identified archaeological foci (sites 1, 3 & 5) are considered to be of Low to Medium Importance. The construction of the Development would have a Substantial Adverse Impact upon these remains. The unmitigated effect of this impact would be considered Moderate/Major Negative.

7.5.7 Site 4, the potential high status Roman building, is considered to be of Medium to High Importance (although the significance of these remains need clarification through intrusive investigation). The majority of this site falls beyond the north-western boundary of the Site and that portion will not be effected by the Development. The portion of Site 4 that does fall within the Site lies in an area that is sown as being a potential location for an attenuation basin (although it is not critical to the overall surface water strategy). The construction of an attenuation basin in this area would have a Moderate Adverse impact upon these remains. The unmitigated effect of this impact would be considered Major Negative.

7.5.8 The nature and significance of site 2 has yet to be determined through intrusive investigation and at present can only be assessed as being of Unknown Importance. The construction of the Development would have a Substantial Adverse Impact upon these remains. The unmitigated effect of this impact is currently Unknown.

7.5.9 The Site is considered to have a moderate potential to contain as yet unidentified archaeological remains of Prehistoric and Roman date. Evidence from the Site and the surrounding area would suggest that any such remains are unlikely to be of more than Low to Medium Importance. The construction of the Development would have a Substantial Adverse Impact upon these remains. The unmitigated effect of this impact would be considered Moderate/Major Negative.

7.5.10 Should the area surrounding Hermitage Plantation (including site 2) prove to contain remains of an early foundation of Garendon Abbey and/or a Medieval Hermitage associated with the Abbey such remains would be considered to be of High Importance. The construction of the Development would have a Substantial Adverse Impact upon these remains. The unmitigated effect of this impact would be considered Major Negative.

Operational Phase

7.5.11 The archaeological resources within the Site will have been removed or preserved in situ during the construction phase. Therefore the operational phase of the Development will have no further impact upon the below ground archaeological resource. All issues regarding the impact of Development upon the settings of designated heritage assets are considered in Chapter 8 of this ES.

7.6 Mitigation Measures

Construction Phase

7.6.1 The work undertaken to date shows that the importance of the archaeological remains within the areas of proposed impact within the Site is not sufficient to prevent development and therefore any such remains can be adequately mitigated in the form of preservation by record or, where feasible, preservation in situ. The first stage of any such works will be to conduct a programme of targeted trial trenching in order to ascertain the extent, date and full significance of the identified archaeological sites. It is proposed to conduct the trial trench evaluation prior to the determination of the application so that the result of the trial trench evaluation will be presented as an addendum to this Environmental Statement which will also include any amendments to the mitigation measures outlined below. It is currently proposed to undertake the trial trench evaluation in September/October 2014.

7.6.2 The Development allows for the possible construction of an attenuation basin over the southern half of the possible high status Roman building (site 4) within the north-western part of the Site. Trial trench evaluation (to be completed before the determination of the Application) will identify the nature and significance of these remains. Should these remains prove to be of High Importance they will be preserved in-situ. Should the remains prove to be of lesser importance and the attenuation basin is required in this area will be subject to preservation by record in the form of full archaeological excavation.

7.6.3 Sites 1, 3 & 5 all fall within areas of proposed below ground impact and as such will be subject to preservation by record in the form of full archaeological excavation.

7.6.4 Should the area around the Hermitage (including site 2) prove to contain remains relating to an early foundation of Garendon Abbey and/or a Medieval Hermitage associated with the Abbey it may prove necessary to find a design solution to preserve any such remains in situ.

7.6.5 Should the trial trenching identify any other as yet unknown archaeological remains they will also be subject to mitigation in the form of preservation by record.

7.6.6 Any excavation that may be required will be agreed with the LPA in advance and could be secured by a suitably worded planning condition.

Operational Phase

7.6.7 The archaeological resources within the Site will have been removed or preserved in situ during the construction phase. The operational phase of the Development will have no further impact upon the archaeological resource; therefore, no mitigation is required.

7.7 Residual Effects

Construction Phase

7.7.1 The effect of construction upon sites 1, 3 & 5 without mitigation is Moderate/Major Negative, however, with appropriate mitigation in place comprising the preservation of remains by record this effect can be reduced to Minor Negative.

7.7.2 The treatment of site 4 can only be determined following full assessment of the significance of the remains by trial trench evaluation. Should Site 4 prove to be of High importance the attenuation basin will not be constructed and therefore there will be no effect upon the remains. Should Site 4 prove to be of Medium Importance or less the effect of the construction of the attenuation basin would be Moderate Negative, however, with appropriate mitigation in place comprising the preservation of remains by record this effect can be reduced to Minor Negative.

7.7.3 The preservation in situ of site 4 is considered a Moderate Beneficial Impact as it would remove the site from arable production which would prevent any further deterioration of the archaeological remains from plough damage resulting in a Moderate/Major Positive Effect.

7.7.4 Should the area around the Hermitage prove to contain remains relating to an early foundation of Garendon Abbey and/or a Medieval Hermitage associated with the Abbey it may prove necessary to find a design solution to preserve any such remains in situ. This would be a Moderate Beneficial Impact as it would remove the site from arable production which would prevent any further deterioration of the archaeological remains from plough damage resulting in a Moderate/Major Positive Effect.

Operational Phase

7.7.5 The recording of the archaeological resource during the construction phase will result in an increased understanding of the archaeology of the locality and also has potential to add to regional research objectives. This is considered to be a Minor Positive Effect.

7.8 Cumulative Effects

7.8.1 Potential cumulative effects of the Development have been assessed in relation to; Loughborough University Science and Enterprise Park, Biffa Waste Incinerator Scheme, Dishley Grange Employment site and Off-site highway improvements / Ashby Road widening. The Development will have no adverse cumulative effect upon the archaeological resource of the area.

7.9 Summary

7.9.1 A summary of the effects of the Development on archaeology is provided in Table 7.4. Effects of the Development upon designated heritage assets is considered in Chapter 8. The only significant below ground impact of development within the Registered Garendon Park is confined to the route of the proposed Strategic Link Road. No significant archaeological remains have been identified along the route of the Strategic Link Road. Other below ground archaeological remains within the Registered Park will not be impacted by development proposals.

7.9.2 The investigative work undertaken to inform the assessment of archaeological effects have identified four main foci of Prehistoric and Roman settlement/funerary activity within the areas of development within the Site.

7.9.3 The work undertaken to date shows that the importance of the archaeological remains within the areas of proposed impact within the Site range from Low-Medium Importance to Medium-High Importance and are therefore not sufficient to prevent development. Under these circumstances any such remains can be adequately mitigated in the form of preservation by record or, where feasible, preservation in situ.

7.9.4 With mitigation measures in place comprising preservation by record the effect of the Development upon the identified archaeological sites 1, 3 & 5 (Prehistoric and Roman settlement/funerary monuments), will reduce from moderate negative to minor negative. The effect on the potential high status Roman building (site 4) will be minor negative or none.

7.9.5 At this stage the presence of medieval remains in the vicinity of Hermitage Plantation (including site 2) is unknown, however, measures are in place to investigate this area, the results of which will be presented as an addendum to this ES. It is intended to undertake the trial trench survey in September/October 2014.

7.9.6 The mitigation measures to preserve archaeological remains by record could be secured by a planning condition in accordance with the NPPF.

Table 7.4 Summary of Effects

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Importance*				Residual Effects (Major/Moderate/Minor) (Positive/Negative/Negligible)
				H	M	L	N	
Construction								
Site 1 – Bronze Age barrow	Permanent	Moderate/Major Adverse	Preservation by record		*	*		Minor Negative
Site 2 – Possible archaeology of uncertain significance	Permanent	Moderate/Major Adverse	Preservation by record/Preservation in situ	Unknown				Unknown
Site 3 – Iron Age? enclosure	Permanent	Moderate/Major Adverse	Preservation by record		*	*		Minor Negative
Site 4 – High status Roman building?	Permanent	Moderate/Major Beneficial	Preservation in situ	*	*			Moderate/Major Positive
Site 5 – Roman field systems and industrial remains	Permanent	Moderate/Major Adverse	Preservation by record		*	*		Minor Negative
As yet unidentified archaeological remains	Permanent	Moderate/Major Adverse	Preservation by record		*	*		Minor Negative
Potential early foundation of abbey / medieval hermitage	Permanent	Moderate/Major Beneficial	Preservation in situ	*				Moderate/Major Positive
Completed Development								
Archaeological resource	Permanent	Minor Beneficial	Increase in archaeological knowledge					Minor Beneficial

*** Level of Importance**

H = High; M = Medium; L = Low; N = Negligible

8 CULTURAL HERITAGE

8.1 Introduction

8.1.1 This Chapter assesses the effects of the Development upon the historic environment. It establishes the value and significance of those heritage assets which are principally above ground within the vicinity of the Site, and it assesses the impact of the Development on the significance of those assets. Archaeological heritage is addressed within Chapter 7 of this ES.

8.1.2 More specifically, this Chapter assesses the effect of the Development on the significance and setting of designated heritage assets in the Site and in the vicinity of the Development. The potential effects arising from both the construction and operation of the Development are considered. The majority of heritage assets affected are located within the boundary of Garendon Park, a Registered Park and Garden which forms part of the Site.

8.1.3 The potential effects of the Development will be both direct and indirect. Direct effects on a heritage asset could arise from effects to the landscape within the Registered Park and Garden or alterations to listed buildings. Indirect impacts of the Development will be on the setting of heritage assets, as defined in the NPPF. Listed building consent will be required for all works directly affecting the fabric, character or appearance of any listed structures.

8.2 Policy Context

Legislation

8.2.1 The Planning (Listed Buildings and Conservation Areas) Act 1990 requires in section 66 that the decision maker in the planning process should have special regard to the desirability of preserving a listed building or its setting or any features of architectural or historic interest which it possesses. The Court of Appeal East Northamptonshire, English Heritage and The National Trust v Secretary of State for Communities and Local Government and Barnwell Manor Wind Energy Limited [2014] EWCA Civ 137 has recently stated that the exercise of this duty requires that considerable importance and weight should be given to the preservation of listed buildings.

8.2.2 Legislation regarding archaeology, including Scheduled Ancient Monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002.

National Policy

8.2.3 By way of introduction it should be noted that the main purpose of the ES is to identify significant effects on the historic environment. This is taken to mean significant effects on the significance of heritage assets, according to the definitions in the NPPF. However, the ES is not the place to identify levels of harm (that is, change which erodes the significance of a designated heritage asset) within the meaning in paragraphs 131 to 134 of the NPPF. Insofar as the NPPF and national Planning Practice Guidance (PPG) and local policies are described below, these are for completeness and background information. It is important to note that significant EIA effects do not correspond to substantial harm within the meaning in the NPPF. Guidance on the NPPF is contained within PPG. Specifically guidance on the setting of heritage assets and how it should be taken into account is contained within paragraph 013 of PPG. Paragraph 015 of PPG contains

guidance as to viable uses for heritage assets and guidance as to heritage based public benefits is contained within paragraph 020 of PPG.

Guidance

8.2.4 In October 2010, English Heritage published '*The Setting of Heritage Assets'* as a non-statutory guidance document intended to assist in the understanding of setting and the ways in which it can be affected by change. The document was produced in the context of, now cancelled, Planning Policy Statement 5 (PPS5), but the general approach remains relevant with the heritage policy context and definitions in the NPPF. The NPPF does not present a material departure from PPS5 insofar as the general principles and approach to the setting of heritage assets is concerned.

8.2.5 Section 2.3 of the guidance deals with views and setting, reinforcing the well-established concept that some views can contribute more to understanding the significance of a heritage asset than others, because the appreciation of relationships between the asset and elements in the view may be particularly relevant. That is almost inevitably the case where there is intentional indivisibility between heritage assets, or between heritage assets and natural features. There may be a multitude of 'incidental' views which do not necessarily make a particular contribution to an asset's significance – or indeed not at all in some instances.

8.2.6 As noted by the guidance and the definition of setting contained within Annex 2 of the NPPF, setting relates to the surroundings in which an asset in experienced. The guidance contained with the PPG notes that a thorough assessment of the impact on setting needs to take into account, and be proportionate to, the significance of the heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it. As such the significance of an asset can also be affected by factors relating to the development during both construction and operation, such as air quality, light, noise pollution, dust and vibration.

8.2.7 The guidance document notes, in Section 4.1, that the protection of the setting of heritage assets need not prevent change. The document recognises that not all heritage assets are of equal importance and states that the contribution made by their setting to their significance will also vary.

8.2.8 In terms of assessment, the most important part of the guidance appears in and after paragraph 4.2, where a stepped approach towards assessment is advocated. The stepped approach is as follows:

> Step 1: Identifying the heritage assets affected and their settings;'
>
> Step 2: Assessing whether, how and to what degree these settings make a contribution to the significance of the heritage asset(s); and
>
> Step 3: Assessing the effect of the Development on the significance of the asset(s).

8.2.9 The stepped approach makes the heritage asset's significance the object of the assessment, and not the Development. This is important because it means that the significance of the asset is the first and foremost consideration, not the type, form or degree of visibility of the Development.

8.2.10 Guidance for Step 3 states importantly that a Development should not be assessed in terms of its impact on setting; instead it should be assessed in terms of the impacts on significance. That is to

say, what matters is not the extent of visibility of the development or change to the setting of an asset, but the extent of change to its archaeological, architectural, artistic or historic interest.

8.2.11 In July 2014 English Heritage produced a series of three consultation drafts of guidance, the series of which is entitled 'Historic Environment Good Practice Advice in Planning'. These three notes, written in the context of the NPPF and PPG, are ultimately intended to replace the current PPS5 Practice Guide. Note 3: Setting of Heritage Assets, in a similar manner as described above advocates a staged approach when considering proposals affecting the setting of heritage assets.

8.2.12 Guidance for Step 4 notes that enhancement may be achieved by actions including restoring or revealing lost historic features, improving public access to, or interpretation of, the assets or the introduction of new features that add to the public appreciation of the asset/s.

Local Policy

8.2.13 The emerging Charnwood Core Strategy represents progress made to date in creating a long term Vision for the Borough. The Core Strategy contains a range of spatial policies and broad locations for suitable development. The emerging Core Strategy was submitted to the Secretary of State in December 2013 and initial Examination Hearing sessions followed in March 2014. Following the Hearings the Inspector wrote to the authority, advising the preparation of additional evidence to support the adoption of a sound Core Strategy. The authority has opted for a suspension of the Examination of the Plan, to allow it the opportunity to provide further evidence to the Examination.

8.2.14 Paragraph 216 of the NPPF advises that draft plans can hold weight within the decision making process. According to paragraph 216, the more advanced a plan, the greater weight that can be given to the draft policies. As a Submission document, this document is in the advanced stages of production and the policies contained are a material consideration as part of this planning application. Policy CS14 sets out the requirements for the protection and enhancement of the Borough's historic assets.

Policy CS 14

Heritage

We will conserve and enhance our historic assets for their own value and the community, environmental and economic contribution they make. We will do this by:

- *Requiring development proposals to protect heritage assets and their setting;*
- *Supporting development which prioritises the refurbishment and re-use of disused or under used buildings of historic or architectural merit or incorporates them sensitively into regeneration schemes;*
- *Working with our partners to prepare Conservation Area Character Statements, Landscape Character Assessments and Village Design Statements;*
- *Supporting developments which have been informed by and reflect Conservation Area Character Appraisals, Landscape Character Appraisals and Village Design Statements;*

- *Supporting developments which incorporate Charnwood's distinctive local building materials and architectural details;*
- *Supporting the viable and sustainable use of heritage assets at risk of neglect or loss, providing such development is consistent with the significance of the heritage asset, especially where this supports tourism or business development;*
- *Securing improvements to the following 'at risk' heritage assets through our major developments:*

  - The Temple of Venus, Garendon Park,Ashby Road, Loughborough

  - The Triumphal Arch, Garendon Park,Ashby Road, Loughborough

  - Roman villa north of Hamilton Grounds Farm, Barkby Thorpe

  - Garendon Park, Garendon, Shepshed

  - Shepshed Conservation Area

  - Taylor's Bell Foundry, Freehold Street, Loughborough

8.3 Assessment Methodology

8.3.1 The assessment has been carried out using a combination of fieldwork and documentary research. The basis for the methodology is that contained in Annex 6 of the Design Manual for Roads and Bridges (DMRB), issued by the Highways Agency in August 2007 (HA 208/07), albeit that some of the tables have been adapted to reflect wording in NPPF and other policy guidance. Some flexibility in the detail of the assessment methodology is envisaged in DMRB in that it is not intended to be prescriptive, that professional judgement is required, and that the matrices are not intended to mechanise judgement (see paragraphs 6.10.5 and 6.13.3 of DMRB in particular).

8.3.2 The methodology first looks at the significance (value/sensitivity) of the heritage assets, then at the magnitude of effects arising from the Development, and then at the significance of the impacts.

8.3.3 Table 8.1 below is adapted from Table 6.1 in Annex 6 of DMRB and sets out a guide for the first stage in this assessment, namely an assessment of the significance of heritage assets. In this case, all the assets in question fall initially into the high sensitivity category for the purposes of the assessment – unless there are particular reasons for considering them under a different category. For example, some heavily altered grade II listed buildings could be categorised as being of medium or even medium/low heritage significance (value/sensitivity), on the basis of informed professional judgement.

Table 8.1 Sensitivities/Importance of Heritage Assets

Importance	Type of Asset - Definition
High	Listed Buildings (of all grades) Registered Parks and Gardens Scheduled Ancient Monuments
Medium	Non-designated structures within the Registered Park and Application Site which have been assessed as providing a positive contribution to the significance of the Park.
Low	Non-designated structures within the Registered Park and Application Site which have been assessed as not providing a positive contribution to the significance of the Park or of any heritage significance

8.3.4 Change can arise as a result of alteration to existing buildings, structures and landscapes and the provision of new development within the Site. Change can also affect the setting of a heritage asset caused by the proximity of development and aspects affecting the enjoyment of the asset such as noise or dust. Such changes can be beneficial or detrimental to the significance of a heritage asset or may have a neutral impact. Changes can also be permanent or temporary and may be reversible or irreversible. The magnitude of change will be considered in terms of high, moderate, minor or negligible.

8.3.5 As a result of the Development there will be some direct (physical) effects on designated heritage assets, these include alterations to the listed buildings and changes to landscape (for example the provision of the Strategic Link Road) through the Registered Park and Garden. Other effects are indirect, which is to say that they are related to the setting of designated heritage assets. The setting is the surroundings in which the significance of the asset is experienced. These indirect effects can be experienced either during the construction phase, or the operational phase, or both.

8.3.6 The magnitude of effect is the subject of Table 8.2 which has been adapted from Table 6.3 of Annex 6 of DMRB, which sets out factors to be used in the assessment, while exercising professional judgement.

Table 8.2 Magnitude of Effect

Magnitude of Change/Effect	Definition
High adverse	Total or significant loss of a heritage asset or its setting resulting in loss of appreciation and understanding of the significance of the asset
High Moderate adverse	Damage or alteration to a heritage asset, including harm to the setting
Low Moderate adverse	Damage or alteration to a heritage asset, including harm to its setting
Minor adverse	Minor loss, damage or alteration to a heritage asset or the setting of a heritage asset, not resulting in the loss of integrity or understanding of the asset
Negligible	No perceptible impact on the significance of heritage assets or the contribution to that significance made by the setting of the asset
Minor beneficial	Improvements to the setting of an asset and/or conservation of the asset
Low Moderate beneficial	Proposals that would reduce the rate of current degradation and/or improve the setting of heritage assets and/or enhance the significance of the assets affected
High Moderate beneficial	Proposals that would significantly reduce the rate of current degradation and/or improve the setting of heritage assets and/or enhance the significance of the assets affected
High beneficial	Proposals that would prevent further degradation of the asset and be consistent with the long term conservation of that asset. Proposals would increase understanding and accessibility of assets and potentially remove elements of the setting which were detrimental to the significance of heritage assets

8.3.7 Table 8.3 contains a matrix which assesses the magnitude of the effect (from the above Table 8.2) in relation to the significance (value/sensitivity) of the heritage asset as it was identified in Table 8.1. Like the other tables it requires professional judgement in order to make the assessment, and the matrix is a tool, not a mechanical system in itself. There are four categories of impact – substantial, moderate, slight and negligible. Any impact falling within the major major/moderate or moderate categories within this matrix (that is, within the part of the table coloured with light red) would be capable of being considered to be a significant impacts. It should be noted that there is no equation to, or calibration with, substantial harm in the sense of paragraph 133 of the NPPF.

Table 8.3 Matrix of Effect and Significance

Importance of Resource	Magnitude of Effect				
	High	High Moderate	Low Moderate	Minor	Negligible
High	Major	Major/Mod	Moderate	Mod/Minor	Minor
Medium	Major/Mod	Moderate	Mod/Minor	Minor	Negligible
Low	Moderate	Mod/Minor	Minor	Negligible	Negligible

8.3.8 It is important to appreciate that it is the designated heritage assets which are the receptors. The setting of these assets is complex, and made up of many components, of which 'key views' to or from the asset in question may only be part. Therefore in any assessment of the impact on the setting of a heritage asset it is important to consider the whole setting of the asset, not to concentrate entirely on a single viewpoint that may in itself not represent the full significance of the building or feature in question. Setting is in itself only one component of significance, which itself is made up of other values or types of interest described above (architectural, archaeological, artistic and historic). Therefore, an effect on the setting of a heritage asset is not the same as an impact on the significance of a heritage asset.

8.3.9 It is also important to note that the amount of public access to a site does not have a bearing on whether its setting adds to that significance. However, proper evaluation of the effect of change within the setting of a heritage asset will usually need to consider the implications for public appreciation of its significance. This assessment has been undertaken on that basis, as advocated in paragraph 117 of the saved Practice Guide supporting PPS5.

8.4 Baseline Conditions

8.4.1 Garendon Park is a grade II Registered Park and Garden, located on the northern edge of Charnwood Forest, in the borough of Charnwood in Leicestershire. The Park occupies an area of around 190ha and lies immediately to the west of Loughborough, in between a post-war (c. 1960s) suburban extension and the M1 motorway to the west.

8.4.2 Aside from the Registered Park, itself there are fourteen designated heritage assets within the park boundary, these are:

- A Scheduled Ancient Monument, in the northern part of the Park divided into two site and comprising the remains of a Medieval Cistercian Abbey and the demolished Garendon Hall, as well as some 17th century garden features associated with Garendon Hall;
- 13 listed buildings, including three eye-catchers, structures associated with the Hall, together with outbuildings, probably of Medieval origin, a lodge house and the boundary wall; and
- A number of other heritage assets outside of the boundary of the Registered Park which could be affected by the Development. These include the Shepshed Mill House (grade II), Oakely Wood Cottages (grade II) and the Stonebow Bridge (grade II).

Garendon Park - Registered Park and Garden

8.4.3 Overall, the significance of the Registered Park is considerable. This is mainly due to the contribution of the three eye-catchers (Triumphal Arch, Temple of Venus and the Obelisk designed by Ambrose Phillips in the 1730s) as residual elements of the now almost completely lost, but historically significant 18th century designed landscape. While significant elements of the designed landscape such as the avenues have been lost and this has had a resultant impact on significant views and vistas, and the appreciation of the designated area as a designed landscape.

8.4.4 The areas of the Registered Park designated as a Scheduled Ancient Monument represent the part of the Park that is of the greatest known archaeological significance. These areas include the remains of the Cistercian Monastery and the remnants of 17th century formal garden features. The agricultural buildings to the north of the Park, boundary wall and various landscape features such as fish ponds also dating from this period remain. Considered as a group, this is significant as upstanding remains of a monastic complex, with a notable level of remaining fabric, albeit altered. Overall, the archaeological interest of the Park is of considerable, albeit with the most significance parts concentrated in the areas of the Cistercian monastic complex.

8.4.5 The designed landscape framework within which the associated and in some instances highly significant buildings stand holds clear architectural interest. This extends to the placement, scale and direct inspiration of the eye-catchers as architectural 'objects' to be appreciated within a broader designed context. Overall, it can be said that the buildings and structures within Garendon Park are of considerable architectural interest

8.4.6 The poor condition of some features of the Park, including the eye-catchers and landscape features such as the canal remnants inhibit the ability to appreciate the significance of the Registered Park. The historic splendour and design of the 18th century landscape is not clearly recognisable in the present-day landscape, which bears little resemblance to a designed parkland. However, some elements such as canals and, significantly, the three eye-catchers survive. Despite the loss of the original design, the residual elements of the designed landscape are of considerable aesthetic interest, in particular Ambrose Phillips' eye-catchers, which were painted even in the 18th century. In the broadest sense something of the original design intention of the landscape with its underlying Arcadian character is still somewhat evident largely due to the three eye-catchers and remaining landscape features. Garendon Park represents the utilisation of natural landscape features such as high ridges to provide a formally designed, fashionable and aesthetically pleasing setting for the now lost Garendon Hall. The way in which the natural topography was exploited to provide ideal locations for Ambrose Phillips' eye-catchers, adding a sense of order, surprise and drama can still be read even if significant elements of landscaping have been lost and this is of some aesthetic interest.

8.4.7 While there are elements of the Park which are considered to hold highly significant historic interest, overall the historic interest of Garendon Park is of some significance. This is mainly due to the severely degraded state of the designed landscape. The listed structures once associated with Garendon Hall and remains of the Cistercian Monastery add to the historic interest of the Park; as well as illustrating something of the past, these also add in a tangible way to the time depth of the Park as important element in both the local and national context. Ambrose Phillips' association with the Society of Dilettanti adds an associative dimension to the historic interest of

the Park and during the 1730s the Registered Park would almost certainly have been highly influential in terms of local, and perhaps wider, tastes. Ambrose Phillips took direct inspiration from Roman antiquity when designing the three eye-catchers (particularly the Triumphal Arch) at Garendon between 1734 and his death in 1737. It is almost certain, due to this early date, that the arch is the first example of taking direct inspiration from ancient Rome for an English building, around 25 years before the publication by Stuart and Revett which influenced others to do the same. The historic interest of the arch and, to a lesser degree the temple, is considered to be particularly high as the first examples of their kind in England.

8.4.8 The visual and historic relationships at Garendon Park take in land to the south to Nanpantan and to the north with wider part of the Garendon Estate. Long views, particularly of the Temple of Venus take in extensive tracts of the surrounding area and from the temple a wide expanse of surrounding land can be experienced. These are not 'unspoilt' or pristine views, in the sense that they are free from modern interference or influence. Amongst others the M1 motorway can be both heard and seen; Ratcliffe Soar Power Station is particularly visible as it the Loughborough University Tower, as well as the buildings of the industrial estate. Conversely the Temple of Venus and White Lodge can be seen over a wide area. However, it is not possible to experience the former designed landscape or parkland from the surrounding area, in the same way and for the same reasons that it is not experienced as such within the Park itself. The open fields which lie to the north and south allow views of and from the Park, but aside from the visibility of the listed buildings in these views, the significance of the Park is not revealed or properly understood. The agricultural fields to the north and south remain mostly as depicted on the 1777 estate map, though many small field enclosures have been lost and replaced with larger post-war fields. There are points within the Registered Park from where the fields are visible, but provides no sense of ownership or connection and the Park itself is fairly well enclosed aside from the views from the higher ground.

Cistercian Abbey and Mansion, with fishpond and mound at Garendon Park - Scheduled Ancient Monument

8.4.9 The remains of the monastery are located centrally within the northern end of the Registered Park, to the north of the Pleasure Grounds and to the south of the grade II listed Entrance Archway to Hall. These features are included within the Scheduled area of the Registered Park. Two elements of the Cistercian Monastery remain visible above ground, including the Chapter House and a section of the abbey drain. The Chapter House remains are sunken into the ground and are constructed of local rubble stone walling. A series of eight column bases and the steps leading out of the Chapter House survive within the footings. The abbey drain, which was later incorporated into the 17th century mansion lies to the south of the Chapter House and originally extended from a pond to a cess-pit beneath the abbey. The exposed areas of drain are topped with large, local flag stones and the drain is known to extend for at least 75m.

8.4.10 The Cistercian Monastery at Garendon is the only example of a Cistercian monastic site within Leicestershire making it unique in the locality and one of only 76 in the country. The designated site is considered to be of national interest. Due to excavations in the mid-20th Century a great deal is understood about the plan, contents and quality of the monastic precinct, including how the monastery was incorporated into Garendon Hall. The agricultural buildings to the north of the site, boundary wall and various landscape features such as fish ponds also date to this period and enhance the significance of the monastic remain. Considered as a group, the monastic remains are highly significant and clearly demonstrate a monastic complex with a

notable level of remaining fabric. In turn, this provides for a high level of understanding about the people and character of the site during the Cistercian occupation

Triumphal Arch (grade I)

8.4.11 The Triumphal Arch is located to the western side of Garendon Park and was cited along the main entrance route. The arch is constructed from ashlar with a moulded round headed carriage arch. The underside of the soffit is highly decorative with octagonal coffering in stucco on a brick base. The east front of the arch has four Corinthian columns on tall pedestals supporting a decorative entablature and attic storey. This elevation displays the highly detailed relief of the Metamorphosis of Actalon. The west elevation features two large Corinthian columns with a large pediment over an entablature and a keystone in the form of a head. As per the original design there were two access doors within the carriage arch and windows to the north and south sides of the arch. These doors provided access inside the Triumphal Arch where there are a series of small rooms.

8.4.12 Dating from the 1730s the Triumphal Arch is the most significant of Ambrose Phillips' eye-catchers. It is highly representative of its type and the survival of the arch contributes to understanding of 18th landscape and folly design. The arch is of high architectural and artistic interest and along with the other eye-catchers reinforces a sense of place within the Registered Park. The Triumphal Arch is of exceptional interest as it is likely to be the earliest known example of Roman remains directly influencing the design of an English structure.

Temple of Venus (grade II)*

8.4.13 The Temple of Venus is located to the east of the Triumphal Arch, connected by a tree lined avenue. The temple stands aloft a high ridge and originally eight tree lined avenues radiated from the temple out to southern half of the Site. The temple is loosely based on the Temple of Vesta at Tivoli and the structure is circular in plan and raised on four steps. There are a series of Ionic columns and the centre of the temple has a single room with rusticated walls. Internally the temple is highly decorative with a patterned slate floor and marble walls. Originally there would have been a statue of Venus in the centre of the temple; however this was lost during the early 19th century, most likely as a result of the Luddite revolutions in 1811.

8.4.14 The survival of three complete eye-catchers positively contributes to the understanding of 18th century landscape and folly design. Overall the Temple of Venus is highly significant in terms of its architectural interest due to quality of design and craftsmanship. The quality of craftsmanship with the carved oak entablature (frieze of ox skulls and bucranium swags) is exceptional. The Temple of Venus hold highly significant artistic interest due to the creative designs employed particularly within the entablatures and the direct inspiration they have taken from the Roman architecture.

Obelisk (grade II)

8.4.15 The Obelisk is located on a high ridge to the north of the Registered Park, on the east boundary of the designated area. Originally the Obelisk was visually connected to the core of the hall site by a long avenue running east to west. This avenue no longer remains and planting now somewhat obscures the scale of the Obelisk, diminishing what would have been a prominent landscape feature and detaching it from its intended spatial and visual context.

8.4.16 The Obelisk is a red brick pyramidal structure which has been rendered and is placed on four large ball feet. This structure is then supported on a stone pedestal with decorative cornice and mouldings. The Obelisk holds high historic significance due to its connection with the two other eye-catchers and its designer, Ambrose Phillips. The Obelisk also has considerable artistic interest due to its structural quality and prominent placement in the landscape. The structure is of considerable architectural significance due to its architectural design and its bold form as part of a structured garden layout.

Entrance Archway to Hall (grade II)

8.4.17 Originally this was one of a pair of arches marking the entrance to Garendon Hall. The arches are dated to the mid-18th century and have been dubiously attributed to either Inigo Jones (1573-1652) or, perhaps more likely, a copy of a Jones design. The segmental archway is stuccoed, with plain pilasters and an entablature with a pediment above. Atop the slate roof is a grand domed cupola. To the north are an original lamp bracket and a large clock face set within the tympanum.

8.4.18 The arch is of some artistic and architectural interest and makes a considerable contribution to the archaeological interest of the site, demonstrating the scale, grandeur and quality of the lost Hall. The feature is of considerable historic interest as part of the early 18th century neo-classic house designed by Ambrose Phillips. Its interest is increased due to its group value with other remnants of the Hall and the associative interest of Ambrose' Neo-Classical connections with the Society of Dilettanti.

Gateway and Railings to Hall (grade II)

8.4.19 The gateway and railings were originally one of a pair of matching gates which flanked the Hall, however no trace of the other remains. They are located to the south of the Hall site, fronting what would have been the south lawn and the Pleasure Grounds which survive today and date from the mid-18th century. This gateway and railings are hidden from the main drive due to mature planting and are located to the east of the gardens. The door case is of rusticated stucco with Doric columns supporting a triglyph frieze and pediment and decorative wrought iron railing extend to either side.

8.4.20 The gateway and railings are of some architectural and artistic interest. The element makes a considerable contribution to the archaeological interest of the site and demonstrate the scale, grandeur and quality the lost hall. The gateway demonstrate the previous formation of the gardens and the once controlled access to and between elements of the 18th century formal gardens. The feature is of considerable historic interest as part of the early 18th century neoclassic house designed by Ambrose Phillips. This element of the lost Hall also has considerable artistic interest as it features in a painting of Garendon Hall attributed to Nattes (circa 1797).

Wrought Iron Screens and Gates (grade II)

8.4.21 The gateways and screens are situated to the east and west ends of the canal (now known as the ha-ha) flanking the stretch of open land directly to the north creating an enclosure on three sides. Originally the screens and gates would have verged a view from the gardens of Garendon Hall out over the canal and down the main double avenue of the parkland, although

this view is no longer available as due to the overgrown planting and severe degradation of the main avenue. The screens are highly decorative and currently in a poor state of repair.

8.4.22 The screens are of considerable artistic and architectural interest due to their design and craftsmanship. The element makes a considerable contribution to the archaeological interest of the Site and demonstrates the previous formation of the gardens and the once controlled access to and between elements of the 18th century formal gardens. This feature, and other remnants of the Hall, are of considerable historic interest as part of the early 18th century neo-classic house designed by Ambrose Phillips and provide a glimpse into the estate.

White Lodge (grade II)

8.4.23 White Lodge is located to the western edge of the Registered Park towards the M1 motorway. It lies on the original entrance driveway to Garendon Hall to the east of the Triumphal Arch. The building likely dates to the 17th century, though it was considerably remodelled in the 19th century to act as an eye-catcher from Ashby Road to the south. The building is constructed of stone with a stucco face and a hipped slate roof with deep eaves. It is two storeys tall and three bays in width; the rusticated south elevation features a large pedimented porch supported by engaged Doric columns.

8.4.24 The White Lodge is of considerable historic significance to Garendon Park. There is substantial potential for evidence to be uncovered during investigation relating to Garendon Park in the 17th century as no other buildings from this period survive. Its 19th century renovation suggests keen motivations of the owner to be recognised as a wealthy man. Its placement is also illustrative of the original approach to Garendon Hall. The White Lodge holds some aesthetic interest due to the function or role of the building and its adaptation. The symmetry and Classical proportions of the front elevation contribute to the sense of place and architectural interest of the Park and the building is of considerable architectural interest.

Lodge to Garendon Park (grade II)

8.4.25 This structure is one of three William Railton lodges at Garendon. The lodge was built in 1847 in a Tudor Gothic manner and is constructed of Charnwood granite with ashlar dressings and a fishscale slate roof. The lodge is fairly decorative and the overarching Tudor Gothic approach linking the lodges provides considerable artistic and architectural interest. The lodge is also of considerable historic significance having been designed by a well-known architect William Railton. The significance of the lodge is enhanced by the association and functional relationship with Registered Park.

Lodge and Archway to north of site of house (grade II)

8.4.26 The lodge is a red brick and dates from the 1830s, designed by William Railton. The building is in a Tudor style with a Gothic four centred carriage arch beneath a flying freehold. To the left hand side of the lodge is a large stair turret with a pyramidal slate roof. The decorative building is in significance having been designed by a well-known architect; William Railton. The significance is enhanced by the association and functional relationship with the Registered Park. The lodge is decorative and of considerable architectural and artistic significance. The lodges form a group and although small, they are elaborate in their design and act as a tease for visitors to anticipate the architectural accomplishment of the now lost house beyond.

Barn (grade II), Outbuildings (grade II) and Dovecote (grade II)

8.4.27 The barn is located to the northern boundary of the Registered Park within the agricultural complex, to the east of the northern lodge. It is likely that this site was the original home farm of Garendon Abbey. It is a large red brick structure dating from the 19th century with slate roof and is grade II listed. To the south of the barn is a large rubble wall with buttresses incorporated into the structure, likely part of an abbey work building dating from the Medieval period.

8.4.28 The outbuildings are located to the northern boundary of the Registered Park within the agricultural complex, to the east of the barn. It is likely that this site was the original home farm of Garendon Abbey. As with the barn, these outbuildings (also listed as a series of cowsheds) are likely Medieval in origin and part of the abbey complex. Above the rubble stone walls is a roof of Swishland slate and to the south side are three engineering brick carriage arches.

8.4.29 The dovecote is located to the northern boundary of the Registered Park within the agricultural complex, to the east of the outbuildings. It is likely that this site was the original home farm of Garendon Abbey. The Dovecote is raised in a combination of rubble stone wall and red brick at upper levels. It likely dates to the Medieval period and internally is fitted out with nesting boxes with stone and brick lips. Externally at the upper levels there is a brick dentil course and wooden louvers. The west side has low doorway with substantial beams and it is thought that this would have been the original entrance to the dovecote.

8.4.30 The three agricultural structures are of high archaeological interest due to their incorporation of Medieval structures, likely to be part of the abbey home farm. The three agricultural buildings at Garendon Park have strong architectural presence and make a considerable contribution to the architectural interest of the Site. The agricultural buildings to the north of the Site are fairly representative of 19th century farm buildings and the medieval remnants of the Cistercian Abbey's home farm demonstrate the earlier land use of the Park. The agricultural buildings within the Park provide some aesthetic interest as reused Medieval structures, with new construction in the 19th century. All three monastic agricultural buildings at Garendon Park are highly significant in terms of their historic interest, due in part to their links with the Cistercian Abbey and also as good quality surviving medieval structures. Their significance is enhanced by the surrounding assets from the same period; the Scheduled Ancient Monument and boundary wall.

Boundary Wall (grade II)

8.4.31 The wall surrounds the Registered Park to the north and north east. The wall is a long length of dry stone rubble walling and likely dates to the Medieval period during the Cistercian occupancy of the land. The grade II listed boundary wall surrounding the north and north west edge of the Site is of considerable historic significance. This is due in part to its Medieval origins and group association with the other structures and features dating from this period. The wall is also of some significance due to its rarity as a Medieval survivor and the use of local stone used for its construction.

The Hermitage Plantation (non-designated)

8.4.32 The Hermitage Plantation is a wooded area to the north of the White Lodge and to the west of the Triumphal Arch. This area of woodland can be seen on 18th century mapping however is not shown as part of the Garendon Estate on the map of 1777. The name suggests that this

area may hold potential for an undiscovered hermitage of either monastic or 18th century parkland derivation. Appendix 8.1 provides an in depth study of available documentary research which seeks to ascertain the history of this area and the likelihood of such a feature being present within this part of the Garendon Estate.

Shepshed Mill House (grade II)

8.4.33 Shepshed Mill is located on Hathern Road to the north of the Site and Registered Park. The building dates from the early 19th century and is a red brick mill with associated outbuildings. The mill is located around 100m to the east of the M1 motorway which is visually and aurally noticeable. The mill has no historic association or use relationship with the Garendon Estate. The mill is of considerable architectural, archaeological and historic interest.

Oakley Wood Cottages (grade II)

8.4.34 Oakley Wood Cottages are located off Hathern Road to the north of the Site and Registered Park. The building dates to the 18tth century with some 20th century alterations present. The cottages, now one residential unit, are historically associated with Garendon and would likely have been workers cottages for the estate. The setting of Oakley Wood cottages contributes to its significance due to historic associations with the land that the occupants served the Garendon Estate in the 18th and 19th centuries. The cottages are of considerable architectural, archaeological and historic interest.

Stonebow Bridge (grade II)

8.4.35 Stonebow Bridge is a listed structure located to the north east of the Registered Park outside of the boundary of the Site. The rubble stone bridge has Medieval origins and has three arches with pointed cutwaters and flat platforms downstream projecting into the brook. The bridge is of considerable historic and archaeological interest.

8.5 Impact Assessment

Construction Phase

8.5.1 The impacts of the temporary construction process will be of lesser magnitude than the operational impacts, however due to the nature of the works they will still result in a direct effect on the Registered Park and Garden and an indirect effect on the setting of heritage assets within Garendon Park.

8.5.2 The main constructional impacts of the Development will arise from direct physical changes to the Registered Park and Garden (and an indirect effect on the setting of other heritage assets within the boundary) through the use of temporary access and haulage tracks.

8.5.3 Further construction phase impacts could result from accidental damage and temporary or permanent alterations to the asset and its setting. While it is unlikely that such aspects of the work will stop works it does represent a constraint that needs careful consideration and appropriate mitigation throughout the design phases as well as later phases.

8.5.4 The impacts of the temporary construction process will be of a lesser magnitude that the operational impacts in respect of the setting of heritage assets, and for this reason only the direct effects of the construction phase on the Registered Park are considered below.

Registered Park

8.5.5 As part of the construction process there will be a number of direct effects on the Registered Park. These will include temporary access, haulage tracks, site clearance, temporary fencing, additional security measures and the removal of vegetation. All effects on the Registered Park as a result of the construction phase are temporary and completely reversible. The overall impact is limited as the construction phase impacts will not result in permanent change to the designated landscape.

8.5.6 This is a high sensitivity receptor where the effect of the Development will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6 Operational Phase

8.6.1 There are a number of operational impacts of the Development.

Strategic Link Road

8.6.2 The first is the presence of the new Strategic Link Road within the Registered Park and Garden, which will bring about a direct effect and visual change to the character of the Registered Park, and also have a potential effect on the setting of heritage assets. The main predicted impacts on setting in this case are views of the road in conjunction with listed buildings. It will increase vibration and noise and will result in increased traffic. Both views from and to listed buildings in conjunction with the road should be considered. For the majority of the buildings affected, the visual impact of the road will be reduced as a result of the design of the Strategic Link Road, local topography of the Registered Park and the close proximity of the road with the established M1 motorway.

8.6.3 The inclusion of a Strategic Link Road to the south of the Registered Park and Garden will have an indirect effect on heritage assets to the south and south west of the Registered Park such as the Triumphal Arch, Temple of Venus, Lodge and White Lodge. The Strategic Link Road will feature in views to and from these listed buildings and increase traffic and noise in their context. The Strategic Link Road design has been undertaken in an honest fashion at grade with appropriate estate type fencing either side in order to embed the road in its context as a route through estate parkland. However, the Strategic Link Road will still feature within significant views to and from these assets.

8.6.4 Listed structures and the Scheduled Ancient Monument to the centre and north/north east of the Site will be mostly screened from the proposed Strategic Link Road due to the natural topography of the area and dense planting. The road will not intervene in any significant views towards these assets or feature in views from them. It will however have a resultant effect on the setting of the listed building as a whole.

Restoration of Park

8.6.5 The next operational impact is the restoration of the Registered Park which will bring about a direct effect and visual change to the character of the Park and also have an effect on the setting of heritage assets within the boundary.

8.6.6 The restoration of the Registered Park will have a direct effect on the designated landscape. Proposals include the reinstatement of tree lined avenues connecting various assets to the

south of the Registered Park and to the Obelisk and the reinstatement of formal Pleasure Grounds to the centre of the Site. Significant views into and out of the Park (particularly views incorporating the three eye-catchers) will be affected by the restoration of the Park. Views into the Registered Park from outside the boundary of the Park will also be affected by the restoration of the landscape. Proposals to restore the Registered Park will have an indirect effect on the designated heritage assets within the Park, primarily the Temple of Venus, Triumphal Arch, Obelisk and the White Lodge. The proposed tree lined avenues will intervene with views of these assets from within the Park and their context as important structures and eye-catchers within the Park.

8.6.7 As part of the restoration of the Park there is a need for some elements of lighting within Garendon Park. For this reason a lighting strategy has been prepared. This strategy includes measures to minimise the effect on the Park. Mitigation includes for example the provision of unlit cycle paths and the use of solar stud lighting along tracks within the Park. Further information relating to the proposed lighting and mitigation in relation to Garendon Park is located within Chapter 6 of this ES. Overall, it is considered that there will be some light spill and 'spots of light'; however this is mitigated by the careful design of the scheme.

Restoration of Assets

8.6.8 A further operational impact is the restoration of the heritage assets within the Registered Park which will result in a direct effect on the physical fabric of the building in question, there will also be a resultant indirect effect as a result of the restoration of the surrounding buildings. This element of the proposal will also have a potential indirect effect on the Registered Park and Garden as a whole. The restoration of the buildings also includes the conversion of buildings to the north of the Site for the provision of visitor facilities.

8.6.9 The restoration of the listed buildings within the Registered Park will have an indirect effect on the designated heritage assets surrounding those buildings. Heritage assets within the Registered Park feature in significant views of other assets and form an important part of the setting of the listed buildings. The restoration of the listed buildings of the Registered Park will result in a visual change to the setting of the surrounding listed buildings which has the potential to have an indirect effect on the assets. The implications of this are further explored later in this Chapter.

Residential Development

8.6.10 The final operational impact of the Development will arise from the presence of residential development to the immediate north of the Registered Park, which will bring about a visual change and have a potential effect on the setting of heritage assets. The main predicted impacts on setting in this case are views of the residential development in conjunction with views into and out of the Registered Park and in conjunction with listed buildings, primarily the Temple of Venus.

8.6.11 The residential development to the north of the Registered Park will be mostly screened from views from the Registered Park due to the topography of the area, planting and siting of the development. However, there will be views from the residential development to the Registered Park and some limited views from areas of the Registered Park into the residential development will exist, including views where previously open agricultural land could be seen. There will also

be views from outside the Registered Park where residential development is seen in conjunction with the listed buildings of the Park, particularly the Temple of Venus. The residential development to the north of the Registered Park will not intervene in any significant views towards the Scheduled Ancient Monument or the listed buildings located in the north and north west of the Park. Significant screening exists between these assets and the residential development to the north. There will be no significant views of the residential development from the Scheduled Ancient Monument or listed buildings or within their immediate surroundings.

8.6.12 A lighting strategy has been prepared for the residential development and includes measures to minimise effects upon Garendon Park, further information relating to the proposed lighting and mitigation for Garendon Park is located within Chapter 6 of this ES. Overall, it is considered that there will be some light spill and 'spots of light'; however this is mitigated by the careful design.

Registered Park

8.6.13 *Strategic Link Road:* The inclusion of the Strategic Link Road within the Registered Park results in a physical change to the Park. The impact is mitigated due to the design of the Strategic Link Road and its associated features, reducing its dominance and assisting in embedding the road within the context of the parkland. This is a high sensitivity receptor where the effect of the Development will be high moderate adverse, resulting in a major/moderate impact that is significant in EIA terms.

8.6.14 *Restoration of Elements of the Park:* The restoration of various elements of the parkland, based on Ambrose Phillips 1730s landscape scheme will have a direct effect on the Registered Park which will result in noticeable physical modification affecting key elements of the Registered Park. The scheme involves the reinstatement of tree lined avenues which reconnect heritage assets within the Park and the restoration of the Pleasure Grounds. This is a high sensitivity receptor where the effect of the Development will be high moderate beneficial, resulting in a major/moderate impact that is significant in EIA terms.

8.6.15 *Restoration of Buildings:* The restoration of the listed buildings within the Registered Park will have an indirect effect on the Park itself due to the works affecting key elements and characteristics of features which make up the Registered Park. The Registered Park is a high sensitivity receptor where the indirect effect of the proposed restoration of the buildings within it will be high moderate beneficial, resulting in a major/moderate impact that is significant in EIA terms.

8.6.16 *Residential Development:* From most positions within the Registered Park the residential development will not be able to be appreciated, however the residential development will feature in limited views from the north west boundary of the Park and on high ridges of the Park, primarily from the Temple of Venus. Views have been prepared which demonstrate that the Development will be visible from the grade II* listed building and will have an effect of the significance of the Registered Park due to this visibility. This is a high sensitivity receptor where the indirect effect of the development will be low moderate adverse, resulting in a moderate impact that is significant in EIA terms.

Scheduled Ancient Monument

8.6.17 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.18 *Restoration of Elements of the Park:* The Registered Park is a high sensitivity receptor where the effect of the proposed restoration of the Parkland will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.19 *Restoration of buildings:* The Registered Park is a high sensitivity receptor where the indirect effect of the proposed restoration of the buildings within it will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.20 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

Triumphal Arch (grade I)

8.6.21 *Strategic Link Road:* The introduction of the road will result in an indirect effect on the Triumphal Arch. However, the impact is mitigated due to the design of the Strategic Link Road and its associated features, reducing its dominance and assisting in embedding the road within the context of the parkland. This is a high sensitivity receptor where the indirect effect of the road will be low moderate adverse resulting in a moderate impact that is significant in EIA terms.

8.6.22 *Restoration of Elements of the Park:* This is a high sensitivity receptor where the indirect effect of the restoration of the Registered Park will be high moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.23 *Restoration of Buildings – Direct Effect:* The Triumphal Arch is currently in a degrading condition and substantial work is required to ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the Triumphal Arch, such as the stone replacement and strengthening works which would affect key elements of the structure. Proposals are also being put forward regarding the conversion of the Triumphal Arch which would include alterations to the roof structure and the reinstatement of windows and doors within the heritage asset. This is a high sensitivity receptor where the direct effect of the restoration of the Triumphal Arch will be high moderate beneficial resulting in a major/moderate impact that is significant in EIA terms.

8.6.24 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.25 *Residential Development:* The residential development to the north of the Registered Park will be almost entirely screened from views with the Triumphal Arch due to planting and siting of the development. Some small scale views may be available where the development could be seen from the Triumphal Arch. However, these only form some views of the Triumphal Arch and should not be considered in isolation. The development will not feature in any significant views of the Triumphal Arch. This is a high sensitivity receptor where the effect of the residential development will be low moderate adverse, resulting in a moderate impact that is significant in EIA terms.

Temple of Venus (grade II*)

8.6.26 *Strategic Link Road:* The introduction of the road will result in an indirect effect on the Temple of Venus and the road will feature in key views of the asset. However, the impact is mitigated due

to the design of the Strategic Link Road and its associated features, reducing its dominance and assisting in embedding the road within the context of the parkland. This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be low adverse resulting in a moderate impact that is significant in EIA terms.

8.6.27 *Restoration of Park:* This is a high sensitivity receptor where the indirect effect of the restoration of the Registered Park will be high moderate beneficial resulting in a major/moderate impact that is significant in EIA terms.

8.6.28 *Restoration of Buildings – Direct Effect:* The Temple of Venus is currently in a poor condition and much work is required to ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the Temple of Venus such as the stone replacement and the reinstatement of a decorative plasterwork interior which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the Temple of Venus will be high moderate beneficial resulting in a major/moderate impact that is significant in EIA terms.

8.6.29 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.30 *Residential Development:* The residential development to the north of the Registered Park will be mostly screened from views with the Temple of Venus due to planting and siting of the residential development. However, there will be views from the residential development to the Temple of Venus and from the Temple of Venus some limited views into the residential development will exist, including views where previously open agricultural land could be seen. There will also be views from outside the Registered Park where the residential development is seen in conjunction with the listed building. This is a high sensitivity receptor where the effect of the residential development will be low moderate adverse, resulting in a moderate impact that is significant in EIA terms.

<u>Obelisk (grade II)</u>

8.6.31 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible resulting in a minor impact that is not significant in EIA terms.

8.6.32 *Restoration of Elements of the Park:* This is a high sensitivity receptor where the indirect effect of the restoration of the Registered Park will be high moderate beneficial resulting in a major/moderate impact that is significant in EIA terms.

8.6.33 *Restoration of Buildings – Direct Effect:* The Obelisk is currently in a degrading condition and much work is required to ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the Obelisk, such as the reinstatement of stucco facing which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the Obelisk will be high moderate beneficial resulting in a major/moderate impact that is significant in EIA terms.

8.6.34 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.35 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

Entrance Archway (grade II)

8.6.36 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.37 *Restoration of Elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.38 *Restoration of buildings - Direct Effect:* The restoration of the Entrance Archway will ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the Entrance Archway which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.39 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.40 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

Gateway and Railings (grade II)

8.6.41 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.42 *Restoration of Elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.43 *Restoration of Buildings - Direct Effect:* The restoration of the Gateway and Railings will ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the listed building which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.44 *Restoration of Buildings – Indirect Effect*: This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.45 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

Wrought Iron Screens and Gates (grade II)

8.6.46 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.47 *Restoration of Elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.48 *Restoration of Buildings - Direct Effect:* The restoration of the Wrought Iron Screens and Gates will ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the listed building which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low moderate beneficial, resulting in a moderate impact that is significant in EIA terms.

8.6.49 *Restoration of Buildings – Indirect Effects:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.50 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

White Lodge (grade II)

8.6.51 *Strategic Link Road:* The introduction of the road will result in an indirect effect on the White Lodge and appear in key views of the building. However, the impact is mitigated due to the design of the Strategic Link Road and its associated features, reducing its dominance and assisting in embedding the road within the context of the parkland. This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be low moderate adverse resulting in a moderate impact that is significant in EIA terms.

8.6.52 *Restoration of Elements of the Park:* This is a high sensitivity receptor where the indirect effect of the restoration of the Registered Park will be high moderate beneficial resulting in a major/moderate impact that is significant in EIA terms.

8.6.53 *Restoration of Buildings – Direct Effect:* The restoration of the White Lodge will ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the listed building which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low mdoerate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.54 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.55 *Residential Development:* The residential development will be mostly screened from the White Lodge, however will result in an indirect effect on the asset. This is a high sensitivity receptor where the effect of the residential development will be low moderate adverse, resulting in a moderate impact that is significant in EIA terms.

Lodge to Garendon Park (grade II)

8.6.56 *Strategic Link Road:* The road is located in close proximity to the grade II designated lodge. The impact is mitigated due to the design of the Strategic Link Road and its associated features, reducing its dominance and assisting in embedding the road within the context of the parkland.

This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be moderate adverse resulting in a moderate impact that is significant in EIA terms.

8.6.57 *Restoration of elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.58 *Restoration of Buildings - Direct Effect:* The restoration of the Lodge to Garendon Park will ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the listed building which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.59 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.60 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

<u>Lodge and Archway to north of site of house (grade II)</u>

8.6.61 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.62 *Restoration of elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.63 *Restoration of Buildings - Direct Effect:* The restoration of the Lodge and Archway will ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the listed building which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.64 *Restoration of building –Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.65 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

<u>Barn (grade II)</u>

8.6.66 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.67 *Restoration of Elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.68 *Restoration of Buildings - Direct Effect:* The restoration of the Barn will ensure the long term conservation of the heritage asset. However, this is one of several structures intended to be converted into visitor facilities. Such works would result in noticeable physical changes to the listed building which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.69 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is not significant in EIA terms.

8.6.70 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

Outbuildings (grade II)

8.6.71 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.72 *Restoration of elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.73 *Restoration of Buildings – Direct:* The restoration of the Outbuildings will ensure the long term conservation of the heritage asset. However, this is one of several structures intended to be converted into visitor facilities. Such works would result in noticeable physical changes to the listed building which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.74 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.75 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

Dovecote (grade II)

8.6.76 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.77 *Restoration of elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.78 *Restoration of Buildings – Direct Effect:* The restoration of the Dovecote will ensure the long term conservation of the heritage asset. However, this is one of several structures intended to be converted into visitor facilities. Such works would result in noticeable physical changes to the listed building which would affect key elements of the structure. This is a high sensitivity

receptor where the direct effect of the restoration of the structure will be low moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.79 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.80 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

Boundary Wall (grade II)

8.6.81 *Strategic Link Road:* This is a high sensitivity receptor where the indirect effect of the Strategic Link Road will be negligible, resulting in a minor impact that is not significant in EIA terms.

8.6.82 *Restoration of elements of the Park:* This is a high sensitivity receptor where the effect of the Development will be minor beneficial, resulting in a moderate/minor impact that is significant in EIA terms.

8.6.83 *Restoration of buildings - Direct:* The restoration of the Boundary Wall will ensure the long term conservation of the heritage asset. Such works would result in noticeable physical changes to the listed wall which would affect key elements of the structure. This is a high sensitivity receptor where the direct effect of the restoration of the structure will be low moderate beneficial resulting in a moderate impact that is significant in EIA terms.

8.6.84 *Restoration of Buildings – Indirect Effect:* This is a high sensitivity receptor where the indirect effect of the restoration of heritage assets within the Registered Park will be minor beneficial resulting in a moderate/minor impact that is significant in EIA terms.

8.6.85 *Residential Development:* This is a high sensitivity receptor where the effect of the residential development will be negligible, resulting in a minor impact that is not significant in EIA terms.

The Hermitage Plantation (non-designated)

8.6.86 *Strategic Link Road:* The Strategic Link Road is proposed to travel through the western edge of the Home Covert and as such has the potential to affect any underground archaeology which is related to past structures in this area. A thorough study of available documentary research has been undertaken (see Appendix 8.1) and the results of this study suggest that the potential for a hermitage feature, either monastic or 18th century, within this area is low. However, any work being undertaken in this area will be carefully managed liaising with archaeological consultants throughout. This is a medium sensitivity receptor where the effect of the Development will be minor adverse, resulting in a minor impact that is not significant in EIA terms.

8.6.87 *Residential Development:* The Hermitage Plantation has some potential for undiscovered elements of either a monastic or a parkland hermitage. However, this area is well screened from the residential development by the dense woodland of the plantation (now known as Home Covert), thus preserving the setting of any potential assets. This is a medium sensitivity receptor where the effect of the residential development will be negligible, resulting in a negligible impact that is not significant in EIA terms.

Listed Buildings outside of the Registered Park

8.6.88 There are three listed buildings outside the boundary of the Registered Park which have the capability of being affected by the Development.

Shepshed Mill (grade II)

8.6.89 *Strategic Link Road:* The inclusion of the Strategic Link Road within the Registered Park and the restoration of the Registered Park and its structures is not considered to have any impact on Shepshed Mill.

8.6.90 *Residential Development:* The residential development will affect the area to the east of Shepshed Mill. This area is proposed to be retained in agricultural use though a developed road (using an existing farm track as a basis) is proposed to provide access to the site in close proximity to the Mill. The employment zone is proposed to be located in close proximity to the Mill and careful consideration of scale, density, bulk, materials, design and heights will be necessary. The development will not feature in any significant views of the listed building. The setting to the west of Shepshed Mill along Hathern Road will remain unaffected by the residential development. This is a high sensitivity receptor where the effect of the Development will be low moderate adverse resulting in a moderate impact that is significant in EIA terms.

Oakley Wood Cottages (grade II)

8.6.91 *Strategic Link Road:* The inclusion of the Strategic Link Road within the Registered Park and the restoration of the Registered Park and its structures is not considered to have any impact on Oakley Wood Cottages.

8.6.92 *Residential Development:* The residential development to the north of the Registered Park will result in change to the setting of the listed building, residential development is proposed to the south of the cottages and this will be screened by way of a dense row of planting. Other areas surrounding the cottages are to be retained in agricultural use. The residential development will not feature in any significant views of the listed building. This is a high sensitivity receptor where the effect of the Development will be low moderate adverse, resulting in a moderate impact that is significant in EIA terms.

Stonebow Bridge (grade II)

8.6.93 *Strategic Link Road:* The inclusion of the Strategic Link Road within the Registered Park and the restoration of the Registered Park and its structures is not considered to have any impact on the Stonebow Bridge.

8.6.94 *Residential Development:* The residential development to the north of the Registered Park will affect the setting of the bridge and result in a visual change to the setting of the listed structure. However, there is a good degree of visual separation between the Site and the bridge meaning that any effect is limited. The residential development will not affect any significant views of Stonebow Bridge. This is a high sensitivity receptor where the effect of the residential development will be minor adverse, resulting in a moderate/minor impact that is significant in EIA terms.

8.7 Summary of Built Heritage Impacts

8.7.1 The following table summarises the significant adverse impacts which have been identified during the assessment. This table is based on the outcomes contained within Section 8.6 of Chapter 8 which take into account all design elements which, as noted, mitigate the impact of the proposals.

Table 8.4 Summary of Significant Adverse Impacts

Asset	Cause of Effect	Significance	Effect	Impact
Registered Park and Garden	Road	High	High Moderate	Major/Moderate
	Development	High	Low Moderate	Moderate
Triumphal Arch	Road	High	Low Moderate	Moderate
	Development	High	Low Moderate	Moderate
Temple of Venus	Road	High	Low Moderate	Moderate
	Development	High	Low Moderate	Moderate
White Lodge	Road	High	Low Moderate	Moderate
	Development	High	Low Moderate	Moderate
Lodge to Garendon Park	Road	High	Low Moderate	Moderate
Shepshed Mill	Development	High	Low Moderate	Moderate
Oakley Wood Cottages	Development	High	Low Moderate	Moderate
Stonebow Bridge	Development	High	Minor	Moderate/Minor

8.7.2 Any other significant impacts identified as a result of the Development are significant beneficial impacts. Beneficial effects can include an improvement or enhancement to the setting of an asset or would prevent further degradation of the asset and be consistent with the assets long term conservation. Such impacts could also see for an increase in understanding and accessibility of assets and potentially remove elements of the setting which were detrimental to the significance of heritage assets.

Table 8.5 Summary of Significant Beneficial Impacts

Asset	Cause of Effect	Significance	Effect	Impact
Registered Park and Garden	Restoration of elements of the Park	High	High Moderate	Major/Moderate
	Restoration of Buildings	High	High Moderate	Major/Moderate
Scheduled Ancient Monument	Restoration of elements of the Park	High	Minor	Moderate/Minor

Asset	Cause of Effect	Significance	Effect	Impact
	Restoration of Buildings	High	Minor	Moderate/Minor
Triumphal Arch, Temple of Venus and Obelisk	Restoration of Elements of the Park	High	High Moderate	Major/Moderate
	Restoration of Buildings – Direct	High	High Moderate	Major/Moderate
	Restoration of Buildings - Indirect	High	Minor	Moderate/Minor
Entrance Archway, Gateway and Railings, Wrought Iron Screens and Gates, Lodge to Garendon Park, Lodge and Archway to north of site of house, Barn, Outbuildings, Dovecote and Boundary Wall	Restoration of Elements of the Park	High	Minor	Moderate/Minor
	Restoration of Buildings – Direct	High	Low Moderate	Moderate
	Restoration of Buildings - Indirect	High	Minor	Moderate/Minor
White Lodge	Restoration of Elements of the Park	High	High Moderate	Major/Moderate
	Restoration of Buildings – Direct	High	Low Moderate	Moderate
	Restoration of Buildings - Indirect	High	Minor	Moderate/Minor

8.8 Mitigation

8.8.1 The restoration of elements of the Park and its buildings are themselves elements of mitigation against the effects of the Development (including the residential development to the north and the inclusion of the Strategic Link Road within the Registered Park.

8.8.2 Numerous elements of the Park are to be restored using the 1777 Estate plan as a basis. These include the tree lined avenues to the south of the Park connecting the Triumphal Arch, Temple of Venus and the White Lodge and to the north reconnecting the Obelisk to the centre of the Park and Hall site. The Pleasure Grounds adjacent to the Hall site are also proposed for restoration. In principle, agreement has been reached to progressively restore Garendon Park and its monuments in a manner which reflects the original 1777 Estate Map. Visitor and heritage facilities are proposed to be provided within the existing complex of listed buildings at the northern edge of the Park by Oxley Gutter.

8.8.3 A comprehensive scheme of restoration of the buildings is proposed following an in depth condition survey of all listed buildings within the Registered Park. All works to listed buildings will require listed building consent which will ensure any alterations etc. are undertaken in an appropriate manner.

8.8.4 Listed building consent is required for all alterations and additions to listed structures that are not considered like-for-like repairs. The requirements of listed building consent should prevent the loss of features, harm to fabric, inappropriate uses, and unsympathetic alterations. This covers all new works and alterations and it is not necessary to introduce another additional framework or mechanism for considering the impacts of proposed alterations. The planning system is also the most appropriate way of securing, for example by conditions, that new works and conservation works are carried out in ways that would not cause damage to the significance

of the Park and its historic buildings. It is nevertheless important to ensure that alterations and repairs are carried out by appropriately qualified contractors, and that repairs which are not like-for-like in every respect are subject to the necessary listed building consent applications.

8.8.5 Further proposed mitigation includes the following:

i. A Conservation Management Plan (CMP) has been prepared by Heritage Collective for Garendon Park. It has assessed the heritage significance of the Park and proposes strategies for its future management. The CMP has been submitted as a separate supporting document to the application.

ii. Proposed mitigation measures also include the provision of public access within Garendon Park and the conversion of some of the arable fields to species rich grazing pasture and planting avenues of parkland trees. The level of public access will be carefully weighed against any adverse impacts to the heritage assets.

iii. Proposed mitigation relating to the proposed new access road includes its careful design, alignment and associated landscaping in conjunction with English Heritage. The proposed Strategic Link Road is to be '*at grade'* with estate type fencing, no curbs are to be installed and minimal lighting and signage proposed. Development has been scaled back to the immediate north of the site allowing a lower density of residential development in areas which are in close proximity to the Registered Park.

iv. The Project would retain and enhance the existing framework of woodlands which currently screen existing residential development at the north western edge of Loughborough, and will also limit views of the proposed residential development from within Garendon Park.

v. No development or planting would be undertaken on the Scheduled Monument. Existing vegetation including woodlands and linear shelterbelt would be retained and enhanced to protect its setting.

vi. Sustainable urban drainage schemes would be provided outside the Registered Park, to avoid associated effects upon the parkland.

8.8.6 Further details of these mitigation measures are included within Chapter 6 of this ES.

8.9 Cumulative Effects

8.9.1 Cumulative effects associated with other external developments were considered, specifically in relation to;

- Loughborough University Science and Enterprise Park;
- Biffa Waste Incinerator Scheme (Application Ref 2009/2497/02 2009/C166/02);
- Dishley Grange Employment; and
- Off-site highway improvements / Ashby Road widening.

8.9.2 Following a consideration of these schemes in respect of Cultural Heritage, cumulative impacts were scoped out and the Development will have no cumulative effect on the cultural heritage.

8.10 Conclusion

8.10.1 The Development will affect the setting of a number of heritage assets and directly affect the significance of a number of heritage assets. In doing so it will have an adverse impact (significant in EIA terms) on the Registered Park, Triumphal Arch (grade I), Temple of Venus (grade II*), White, Lodge to Garendon Park, Shepshed Mill, Oakley Wood Cottages and Stonebow Bridge (all grade II). Full details of the adverse impacts can be seen in Table 8.4. As a result of the Development there will also be a series of beneficial impacts, which are significant in EIA terms, on a number of the heritage assets identified. Full details of these beneficial impacts are outlined in Table 8.5.

8.10.2 As noted above in section 8.8 there are numerous elements of mitigation proposed. Further details of these mitigation measures are included within Chapter 6 of this ES.

9 TRAFFIC AND TRANSPORT

9.1 Introduction

9.1.1 This section assesses the traffic and transportation impacts and effects related to the traffic generated onto the local highway network as a result of the Development.

9.2 Planning Policy

9.2.1 The objectives for the Development have been defined taking into account national and local policies that seek to safeguard the environment and resources and to put into practice the principles of sustainable development. Consideration has been given to the following documents.

- Transport White Paper: 'Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen';
- National Planning Policy Framework;
- The Strategic Link Road Network and the Delivery of Sustainable Development (DfT Circular 02/2013);
- Guidance on Transport Assessment;
- Building Sustainable Transport into New Developments;
- Smarter Choices – Changing the Way We Travel (2004);
- Manual for Streets and Manual for Streets 2;
- Charnwood Core Strategy Draft;
- Charnwood Borough Local Plan;
- Leicestershire County Council – Local Transport Plan 3;
- Leicestershire Rights of Way Improvement Plan; and
- 6C's Design Guide.

9.2.2 A summary of regional and local policies relevant to the Development is documented below.

Transport White Paper: *'Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen'*

9.2.3 The White Paper 'Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen' (January 2011) sets out the government's vision "...*for a transport system that is an engine for economic growth but one that is also greener and safer and improves quality of life in our communities*".

9.2.4 The two key themes of the White Paper are:

- Offering people sustainable transport choices, particularly for shorter journeys, that will stimulate behavioural change.
- Demonstrating how localism and the big society can work for transport.

9.2.5 The stated DfT priority for local transport is:

- Encourage sustainable local travel and economic growth by making public transport and cycling and walking more attractive and effective, promoting lower carbon transport and tackling local road congestion.

9.2.6 The Development is well connected in relation to Shepshed and Loughborough, with significant opportunity for travel by non-car modes. The Development includes improvements to pedestrian, cycling and equestrian routes as well as provision of bespoke bus services. A comprehensive Travel Plan (Appendix 9.2) has also been produced which includes measures and initiatives to encourage sustainable travel. The Development is therefore fully in accordance with the Transport White Paper.

National Planning Policy Framework (NPPF)

9.2.7 The NPPF was published on 27 March 2012 and constitutes guidance for Local Planning Authorities and decision-takers both in drawing up Development Plans and as a material consideration in determining applications. The NPPF replaces previous planning policy statements and planning policy guidance. As outlined in paragraphs 32 and 36 of the NPPF, a Transport Assessment (Appendix 9.1) and Framework Travel Plan (Appendix 9.2) have been prepared as part of the planning application submission documents.

9.2.8 At the heart of the NPPF is a presumption in favour of sustainable development. In terms of transport, one of the core planning principles is to actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are, or can be made sustainable.

9.2.9 The NPPF states that developments should be located and designed where practical to give priority to pedestrian and cycle movements, and have access to high quality public transport facilities; create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians; and consider the needs of people with disabilities by all modes of transport.

9.2.10 The Development is well connected in relation to Shepshed and Loughborough with significant opportunity for travel by non-car modes. The Development includes improvements to pedestrian, cycling and equestrian routes as well as provision of bespoke bus services. A comprehensive Travel Plan has also been produced which includes measures and initiatives to encourage sustainable travel. The Development is therefore fully consistent with the NPPF.

The Strategic Link Road Network and the Delivery of Sustainable Development

9.2.11 This document was issued in February 2013 and sets out the way in which the Highways Agency (HA) engage with communities and developers to deliver sustainable development and thus

economic growth whilst safeguarding the primary function and purpose of the strategic road network.

9.2.12 The scope of the TA (Appendix 9.1) has been agreed with the HA as part of the monthly Transport Working Group (TWG) meetings. The TWG comprises of representatives of Charnwood Borough Council (CBC), Leicestershire County Council (LCoC) and the HA. The methodology applied has been agreed in accordance with the guidance set out in this document.

Guidance on Transport Assessment

9.2.13 The joint Department for Transport (DfT) and the Department for Communities and Local Government (DCLG) document '*Guidance on Transport Assessment'* provides guidelines on the scope and assessment methodology to be applied when preparing a TA. The TA (Appendix 9.1) follows these guidelines and has been prepared using a methodology agreed with the TWG.

Building Sustainable Transport into New Developments

9.2.14 The DfT's 'Building *Sustainable Transport into New Developments'* sets out the Government's advice on how to build an effective sustainable transport system in new developments, from planning to the implementation stage. The document recommends a variety of different transport options to integrate and adopt according to the location and needs of each individual development.

9.2.15 Examples of design features that the document identifies to encourage sustainable transport usage include:

- Comprehensive direct networks for walking, cycling and public transport;
- Limited private vehicle access to homes and services;
- Situating key services such as health centres and schools in central locations within the town;
- Traditional compact town layouts;
- Inclusive street environments that aim to integrate the activities of pedestrians, cyclists and motorists;
- Car-free areas within a development;
- Pedestrianised shopping areas which are served by direct cycle routes and public transport; and
- Joined-up transport networks with good interchanges.

9.2.16 The document goes on to state that '*walking neighbourhoods are typically characterised as having a range of facilities within 10 minutes walking distance (around 800 metres)*'.

9.2.17 The proposed Masterplan has a range of facilities within a 10 minute walking distance and where appropriate includes many of the design features outlined in the '*Building Sustainable Transport into New Developments'* document.

Smarter Choices – Changing the Way We Travel

9.2.18 The publication of the "*Smarter Choices – Changing the Way We Travel*" report by the Department for Transport (DfT) provided reinforcement of the stature of soft factors within the overall context of transport planning. These soft factors encompass workplace and school travel plans, as well as other initiatives such as car sharing schemes, car clubs, personalised journey planning, teleworking, teleconferencing, information and marketing, and home shopping.

9.2.19 These measures are becoming increasingly important issues for the Department for Transport (DfT), and the provision of targeted information, marketing and incentives are receiving much higher priority. The research into '*soft*' factors that was published in the report has been viewed as a significant milestone. As such, soft factors have a role in their own right in raising awareness of the available journey options and as a support measure for other more traditional interventions in the transport arena, such as mobility management schemes, infrastructure and service-related measures.

9.2.20 A Framework Travel Plan (Appendix 9.2) has been prepared for the Development which includes a comprehensive package of Smarter Choices measures.

Manual for Streets and Manual for Streets 2

9.2.21 The Manual for Streets is applicable to the design, construction, adoption and maintenance of streets. It encourages those involved in the design process to think creatively about their various roles in the delivery of streets, breaking away from standardised, prescriptive, risk-averse methods to create high quality places. The emphasis of design should be on prioritising the needs of pedestrians, cyclists and public transport.

9.2.22 The Manual for Streets 2 (MfS2) document was published in September 2010. MfS2 does not supersede the Manual for Streets and is a companion document that explains how the principles of the Manual for Streets can be applied more widely. MfS2 demonstrates through guidance and case studies how these principles can be extended beyond residential streets to encompass both urban and rural situations. The proposed Masterplan has been informed by the Manual for Streets and the Manual for Streets 2.

Emerging Charnwood Core Strategy

9.2.23 The Development forms part of the 'West of Loughborough Growth Area' as outlined in the emerging Charnwood Borough Council Core Strategy. In addition to the Development, the growth area includes an extension to the existing University Science and Enterprise Park to the south of the A512(T). As of April 2014, the Core Strategy Examination In Public (EIP) has been suspended by the Planning Inspectorate for approximately 9 months, to allow Charnwood Borough Council to provide the examination further evidence on housing need.

9.2.24 The Development is included in Policy CS22. The Policy identifies a SUE consisting of approximately 3,000 homes, 16ha employment, a local centre, education provision and open space. The proposed Masterplan includes these land uses.

9.2.25 The emerging Core Strategy identifies a package of transport improvements as part of the Development as follows:

- new and improved cycling and walking routes, well related to the green infrastructure network, connecting to new and existing employment areas including the Science & Enterprise Park and Dishley Grange, new and existing centres and Garendon Park;
- new and enhanced bus services linking the new community with local employment opportunities, Loughborough Town Centre, Shepshed District Centre and Loughborough Railway Station;
- a new road providing the function of a high street where is passes through the new main centre;
- a new Strategic Link Road through the Development to connect to the A512(T) at the south and the A6(T) (south of Hathern) to the north;
- a new road link from the Strategic Link Road to Hathern Road;
- dualling of the A512(T) between Snell's Nook Lane and M1 motorway Junction 23;
- capacity improvements to M1 motorway Junction 23; and
- other network improvements as identified by an appropriate Transport Assessment.

9.2.26 As outlined in the TA (Appendix 9.1), the Development proposes transport improvements in line with those identified in the Core Strategy and is therefore fully consistent with the emerging Core Strategy.

9.2.27 The extension to the University Science and Enterprise Park is included in Policy CS23. The extension will form phases 3 and 4 of the existing Science and Enterprise Park which opened in 1992. The Science and Enterprise Park extension covers an area of 77ha with 35ha on land south of the A512(T) and east of Snells Nook Lane, and 42ha on land south of the A512(T) and west of Snells Nook Lane. The emerging Core Strategy identifies that the Science and Enterprise Park will deliver at least 111,000sqm of floor space by 2028 focusing on technology and research/development industries. One of the accesses to the Science Park extension is likely to be shared with the proposed A512(T) and the SUE access and it will therefore be important that any access proposals for the Development are not detrimental to the future extension of the University Science and Enterprise Park. Furthermore, CBC, LCC and the HA have requested that the cumulative impact of both the Development and the University Science and Enterprise Park Extension were considered in the TA. This is addressed in later in this Chapter.

9.2.28 In addition to the 'West of Loughborough Growth Area' the emerging Core Strategy identifies Shepshed as a 'direction for growth' with the opportunity to deliver at least 500 homes by 2028. CBC, LCC and the HA have requested that the cumulative impact of both the Development and possible future development in Shepshed be considered in the TA. This is addressed later in this Chapter.

Charnwood Borough Local Plan

9.2.29 The current Borough of Charnwood Local Plan was adopted in January 2004. The Plan retained Development Plan status until September 2007. After this date only policies specifically agreed by

the Secretary of State have retained this status. The following section summarises relevant Transport Policy objectives in the Plan which have been saved:

Policy TR/5 (Transport Standards for New Development):

> *"Planning permission will be granted for development which is, or forms part of a larger scheme, for 25 or more dwellings … where the development is in an urban location well served, or capable of being well served, by non-car modes and having short walking, cycling and public transport links to Town and district centres or existing rail stations."*
>
> *"The site should fall "within approximately 400 metres of a potential bus route, with bus shelters, bus lay-bys and information points provided at main stops" and "the needs and safety of pedestrians should be met in terms of access to the site and the inclusion of an integrated public footpath system which avoids roads wherever possible and provides … linkages with the established network outside the site, and safe road crossings where needed."*
>
> *"The needs and safety of cyclists" should be "met in terms of access to the site and the inclusion of special features such as cycleways, cycle lanes, safe cycle crossings and direct links between land uses, and between the site and adjoining cycleway provision."*
>
> *"Proposals should make "adequate provision for vehicular access and circulation, highway design and layout and servicing arrangements. In approving detailed housing layouts the Borough Council will expect schemes to utilise the lowest order of road compatible with the scale of development to be served."*

9.2.30 In order to satisfy Policy TR/5, the Masterplan has been developed with a comprehensive network of pedestrian and cycle routes both within the Site and to existing local destinations. The street hierarchy has been developed so that all households will generally be within 400m of a bus stop and bespoke bus services are proposed from development opening. The internal road layout has been developed using the 6Cs Design Guide and the Manual for Streets 1 and 2.

Policy TR/6 (Traffic Generation from New Development):

> *"Planning permission will not be granted for development on non-designated sites where the impact of traffic generated by an individual proposal or the cumulative impact together with other committed and allocated development in the locality would result in unsafe and unsatisfactory operation of the highway system; or have a significant adverse impact on the environment… In all cases measures should help to reduce car use to and from development and contribute to genuine and effective transport choice facilities through the encouragement of walking, cycling and the use of public transport for occupiers jointly or separately. New development must be acceptable in terms of its impact on the existing highway network… Developments will not be permitted which would add unacceptably to*

congestion and delay, generate additional on-street car parking and manoeuvring, or damage local amenities particularly in residential areas."

9.2.31 Where necessary, the TA (Appendix 9.1) identifies highway capacity improvements to mitigate the impact of the Development. The Development is therefore fully consistent with Policy TR/6.

Policy TR/13 (Access for Cyclists and Pedestrians):

"The Borough Council will seek to develop its strategy for a network of pedestrian and cycle routes by direct funding and through development proposals in this Plan. The Borough Council will also seek to negotiate contributions to secure off site connections into and improvements to the wider networks of footways and cycle routes where this is practicable and directly related to development schemes. Planning permission will not be granted for development schemes that fail to comply with briefs designed to develop the strategy or to meet the standards for footway and cycle routes contained in Supplementary Planning Guidance. Routes along which measures will be encouraged to make cycling safer and more attractive and which will be protected from development proposals likely to prejudice their use for cycling are shown on the Proposals Map."

9.2.32 In order to satisfy Policy TR/13, the Masterplan has been developed with a comprehensive network of pedestrian and cycle routes both within the site and to existing local destinations.

Policy TR/18 (Parking Provision in New Development):

"Planning permission will not be granted for development unless off-street parking for vehicles, including cycles, and servicing arrangements are included to secure highway safety and minimise harm to visual and local amenities."

9.2.33 In order to satisfy Policy TR/18, parking will be provided in accordance with the latest parking standards.

Leicestershire County Council – Local Transport Plan 3

9.2.34 The third Local Transport Plan (LTP3) for the County of Leicestershire covers the period up to 2026, and was adopted on 1st April 2011. It sets out the long-term transport strategy and Vision for transport to 2026 and provides a framework for how the County Council will manage and develop their transport system in the future.

9.2.35 The long term Vision for the transport system in Leicestershire is:

"Leicestershire to be recognised as a place that has, with the help of its residents and businesses, a first class transport system that enables economic and social travel in ways that improve people's health, safety and prosperity, as well as their environment and their quality of life."

9.2.36 LTP3 has 6 strategic transport goals. These are:

- *Goal 1 – a transport system that supports a prosperous economy and provides successfully for population growth;*
- *Goal 2 – an efficient, resilient and sustainable transport system that is well managed and maintained;*
- *Goal 3 – a transport system that helps to reduce the carbon footprint of Leicestershire;*
- *Goal 4 – an accessible and integrated transport system that helps promote equality of opportunity for all our residents;*
- *Goal 5 – a transport system that improves the safety, health and security for our residents; and*
- *Goal 6 – a transport system that helps to improve the quality of life for our residents and makes Leicestershire a more attractive place to live, work and visit.*

9.2.37 The location of the Site will mean people are within easy reach of a range of transport options which give people the choice to travel using modes other than the private car.

Leicestershire Rights of Way Improvement Plan

9.2.38 The Leicestershire Rights of Way Improvement Plan (ROWIP) considers how best to manage and develop the Rights of Way network in the County. The following policies are relevant to the Development:

Policy P3: Developers will be expected to maximise the potential for access within, to, and from new developments by walking and cycling. This should include links to travel plans and public transport.

Policy P4: Infrastructure assessments to access new development sites, including for developer contributions, should include foot and cycle proposals.

Policy P5: Consideration should be given to linking new housing sites into the surrounding recreational networks or where there isn't one, creating routes that link to surrounding paths, communities or facilities.

9.2.39 In accordance with the Policies in the ROWIP, the Development includes improvements to existing Public Rights of Way as well as the creation of new walking, cycling and equestrian routes. This will maximise connections with existing facilities and amenities in Loughborough and Shepshed.

6C's Design Guide

9.2.40 The '6C's Design Guide' deals with highways and transportation infrastructure for new developments in areas for which Leicestershire County Council, Leicester City Council,

Nottinghamshire County Council, Derbyshire County Council and Derby City Council are the highway authorities. The Masterplan has been designed using the 6C's Design Guide.

Methodology and Scope

9.2.41 The methodology applied in the Transport Assessment (and accompanying Travel Plan) follows the guiding principles set out in the 'Guidance on Transport Assessment' (2007) – Department for Communities and Local Government. This Chapter builds on the work undertaken in the Transport Assessment using the 'Guidelines for the Environmental Assessment of Road Traffic' (1993) – Institute of Environmental Assessment (IEA, now the Institute of Environmental Management and Assessment (IEMA).

Assessment Methodology

9.2.42 The following rules, taken from the IEMA's guidelines, have been used as a screening process to define the scale and extent of the assessment and inform the application of EIA terminology to traffic impacts:

- Rule 1 – Include highway links where traffic flows are predicted to increase by more than 30%; and

- Rule 2 – Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more. It should be noted that increases below 10% are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level are therefore assumed to result in no discernible environmental impact unless there is a notable alteration in the composition of vehicle types (i.e. a large permanent increase in HGV numbers).

9.2.43 The IEMA guidelines refer to assessment of development impact on link flows to establish the overall 'without-development' and 'with development' two-way flows for the links preceding the junctions arms subject to a material increase. The 'Guidelines for the Environmental Assessment of Road Traffic' suggest that assessment should be carried out for the 'scoped-in' areas regarding the following effects:

- Severance;

- Driver delay;

- Pedestrian delay;

- Pedestrian Amenity;

- Fear and intimidation; and

- Accidents and Safety.

Assessment Criteria

9.2.44 The magnitude of the effects must be examined in order to determine whether they are considered to be 'significant'. The IEMA guidelines imply that there are no simple rules or formulae that can be applied to determine the magnitude of such effects. Therefore a judgement must be made, based upon the information and data available.

9.2.45 An ES must identify the potential significant effects of a development and these impacts can generically be classified as being:

- adverse, beneficial or neutral;
- short, medium or long term;
- direct or indirect; and
- permanent or temporary.

9.2.46 To assess significance two factors need to be considered, the magnitude of change and the sensitivity of the receptor.

- Magnitude of change identifies the extent of the impact from the original baseline conditions of the site or surrounding area (the scale of impact) and is measured as high, medium, low or negligible; and
- Sensitivity of receptor identifies the receptors which could be impacted by the Development and judges how vulnerable the receptor is to the impact and is based largely on professional judgement.

9.2.47 Table 9.1 below shows initial significance criteria which underscores the assessment of significance for each Chapter. Where appropriate and relevant each discipline then evolves the criteria in relation to their specific professional areas. Significance is measured as major, moderate, minor or negligible.

Table 9.1 Initial Significance Criteria

		Sensitivity of Receptor			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change	**High**	Major	Major	Moderate	Negligible
	Medium	Major	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

9.2.48 The percentage increase in traffic levels over existing levels due to the development has been used as the criteria for magnitude of change. Given the Guidelines outlined earlier, it has been assumed that any change in excess of 30% is considered to be high, between 10%-30% to be medium, between 5%-10% to be low and below 5% to be negligible. (It should be added that, prior to the introduction of the 2007 Transport Assessment Guidelines, any road with an increase in traffic of less than 5% did not require further consideration).

9.2.49 The sensitivity of receptor has been graded according the development type. It is reasonable to assume that this would apply to environment around the land use as well as the type land use itself.

9.2.50 Table 9.2 below summarises the significance criteria by magnitude and sensitivity that will be used in the assessment.

Table 9.2 Significance Criteria by Magnitude and Sensitivity

		Percentage increase in traffic	***Sensitivity of Receptor***			
			High	**Medium**	**Low**	**Negligible**
			Road near hospital school, residential street	Residential distributor road	Road fronting retail, office leisure	Road access to warehouse factory farmland
Magnitude of Change	**High**	>30%	Major	Major	Moderate	Negligible
	Medium	10%-30%	Major	Moderate	Minor	Negligible
	Low	5%-10%	Moderate	Minor	Minor	Negligible
	Negligible	<5%	Negligible	Negligible	Negligible	Negligible

9.2.51 The outcome of evaluation against these criteria will be used to make a judgement on the magnitude of each effect at each identified location in terms of magnitude and sensitivity. Thus a dwelling incurring an increase in traffic of 5%-10% would be classified as having a direct impact of long term minor adverse significance.

9.2.52 In order to judge the impact of the Development against the above criteria, this is best undertaken as a two stage process - one prior to the implementation of mitigation measures and one following the implementation of mitigation measures. This is discussed in more detail later in the Cumulative Impacts Chapter.

Baseline Data Collection

9.2.53 The study area where data was required for has been agreed with the TWG. Data has been collected for all key junctions and links in the area around the Site encompassing routes to Loughborough, Shepshed and the M1.

9.2.54 The traffic impacts of the Development will be directly affected by the level of movements on and off site through the construction and fully operational / occupied phases of the Development.

9.3 Baseline Environment

Local Highway Network

9.3.1 The A512(T) Ashby Road adjacent to the Site is aligned approximately east to west adjacent to the southern boundary of the Site and is subject to the National Speed Limit. The speed limit reduces to 40mph west of the A512(T)/Snells Nook Lane junction. The route provides a link between Loughborough in the east and Shepshed in the west. M1 Junction 23 is located adjacent to the south-west of the Site and is accessed from the A512(T). In the vicinity of the site, the A512(T) is a single carriageway road with one lane in each direction. The road is lit and has a shared footway/cycleway adjacent to the northern side of the road. To the east of M1 Junction 23, the A512(T) Ashby Road/Snells Nook Lane junction is signal controlled. Between the Snells Nook Lane junction and M1J23 is the existing private access to Garendon Park which is a ghost island priority junction.

9.3.2 The M1 is located adjacent to the western boundary of the Site and is aligned approximately north to south. M1 Junction 23 is partially signal controlled and is the nearest motorway junction to the Site.

9.3.3 The A6(T) is aligned approximately north to south to the east of the Site and provides a route through the centre of Loughborough south towards the A46 and Leicester. To the north the A6(T) provides a route to the M1 at Junction 24. Adjacent to the Site, the speed limit changes from 50mph to the National Speed Limit. The 50mph speed limit applies to a single carriageway section of the A6(T) extending south to Loughborough. The National Speed Limit applies to a single lane dual carriageway section extending north. The A6(T) is lit in the vicinity of the Site. To the south of the Site frontage, priority junctions provide access to existing residential areas, Charnwood Golf Complex and Dishley Grange Farm. A shared footway/cycleway is located adjacent to the eastern side of the carriageway, providing a route north towards Kegworth and south into Loughborough.

9.3.4 Hathern Road is a single carriageway road with one lane in each direction and is aligned adjacent to the north-west boundary of the Site. Hathern Road provides a link between Shepshed and the A6(T). The section of Hathern Road near Shepshed is subject to a 40mph speed limit although this changes to the National Speed Limit approximately 130m north of the existing simple priority junction with the Civic Amenity Site. No street lighting is provided in the vicinity of the junction with the Civic Amenity Site. A footway is located adjacent to the eastern side of the carriageway.

Non-Motorised Users

9.3.5 Key existing pedestrian and cycle infrastructure within and adjacent to the site includes:

- National Cycle Route 6 runs east to west through the centre of the Site offering a connection with Loughborough and Shepshed. Further afield, the route provides a connection to Derby and Leicester;
- A number of Public Rights of Way (PROW) run east to west through the Site between northern parts of Shepshed and Thorpe Acre;
- A disused railway line currently extends in to the south-eastern corner of the Site. Immediately outside the Site boundary the route is identified as an off-road surfaced / un-surfaced cycle route. This forms part of a route in to the centre of Loughborough; and
- Off road cycleways are located adjacent to the A6(T) Derby Road providing a route between Loughborough and areas to the north.

9.3.6 The infrastructure identified above is in addition to a comprehensive network of off-street and on-street walking/cycling routes throughout Loughborough and Shepshed. Furthermore, there are a number of informal paths/routes throughout the existing Site e.g. on the top of the ridge to the north of the Site and providing north to south connections.

9.3.7 The level of public transport provision in the vicinity of the Site is very good. Public transport provision on the western side of Loughborough is characterised by high frequency, high capacity vehicle services between Shepshed and Loughborough using the A512(T) Ashby Road corridor. Typical frequency between Loughborough and Shepshed is approximately 4 buses an hour in each direction.

9.3.8 The operating times of services in the vicinity of the Site therefore cater for peak period commuter travel as well as retail, leisure and other trip types. The services operate adjacent to the Site and key destinations in the local area such as, Loughborough Town Centre, Shepshed Town Centre, Loughborough University, Loughborough Hospital, Loughborough Train Station, local schools and adjacent to the proposed University Science and Enterprise Park and proposed Dishley Grange employment site. In summary, existing bus services currently serve most key destinations in Loughborough and Shepshed. Buses therefore provides a genuine alternative to the private car and should assist in encouraging significant modal shift away from the private car.

Baseline Traffic Flows

9.3.9 In order to allow an assessment of the potential impacts of the Development on the surrounding highway network the background traffic flows in the study area have been examined. These background traffic flows have been factored to the assessment years of 2021, 2026 and 2031 using NTM national growth forecasts adjusted by TEMPRO 6.2 local forecasts for Loughborough.

9.3.10 Full details of the background traffic flow data can be found in the Transport Assessment in Appendix 9.1.

Relative Scheme Design Features Considered

9.3.11 The SUE will be developed with the aim of becoming a leading example of environmentally, socially and economically sustainable development. The Masterplan for the Site has the following key characteristics:

- A Strategic Link Road will be provided through the Site between the A6(T) and A512(T) Site accesses.
- Garendon Park will be retained and restored. The Park will be opened for public access.
- A large area of open space will be provided along the Black Brook corridor.
- Residential land uses will be provided in northern and central areas of the Site.
- Employment land uses will be provided towards the west of the Site in the vicinity of the existing Civic Amenity Site.
- A Community Hub will be provided in the centre of the Site, adjacent to the proposed Strategic Link Road.

9.3.12 Three vehicular Site accesses will be provided. A new junction will be provided onto the A512(T) Ashby Road – potentially to be shared with development access to the proposed University Science and Enterprise Park Extension. This junction will form the southern end of the Strategic Link Road through the Site. A new junction will be provided on to the A6(T) Derby Road – to be combined with the consented development at Dishley Grange. This will be a roundabout and will form the north/eastern end of the Strategic Link Road through the Site. A third new junction will be provided on to Hathern Road.

9.3.13 The Development will be designed in a manner to ensure that it is a well-connected area not dominated by the car. The area is to be designed so as it meets the needs of the people living there rather than the motorcar.

9.3.14 A number of pedestrian / cyclist only access locations are also shown on the Masterplan. Development at the Site provides the opportunity for existing connections to be improved and enhanced. This will improve connectivity for development at the Site, but also for the existing Loughborough/Shepshed area.

Potential Environmental Impacts and Effects

9.3.15 The methodology to forecasting the traffic impact of the Development has been agreed with the TWG. The agreed methodology uses a manual spreadsheet based model. Full details are presented in the Transport Assessment at Appendix 9.1.

Trip generation and percentage increase in traffic

9.3.16 The estimated vehicle trip generation is shown in Table 9.3.

Table 9.3 – External Vehicle Trip Generation

	AM Peak			PM Peak		
	In	Out	Total	In	Out	Total
2021 Vehicle Trip Generation	116	286	402	245	127	371
2026 Vehicle Trip Generation	484	768	1251	649	477	1122
2031 Vehicle Trip Generation	644	1163	1807	987	652	1634

9.3.17 Full details of the trip generation are presented in the Transport Assessment (see Appendix 9.1). The Transport Assessment also provides details of the trip distribution methodology. The estimated trip distribution is based on existing travel patterns in the Loughborough area.

9.3.18 It should be added that the assessment and evaluation process makes no consideration of the sustainable development proposals, so it can be regarded as a 'worst-case' scenario of traffic generated by the Development.

9.3.19 Following Development completion, traffic flows on Hathern Road in the vicinity of the SUE are estimated to increase by more than 30% as a result of the Development traffic and existing traffic re-routing through the Site. Following Development completion, traffic flows on the A512(T) and the A6(T) (in the immediate vicinity of the Site) as well as Epinal Way (south of the A512(T)) are estimated to increase by more than 10% (but less than 30%) without any off-site improvements. Nevertheless, as demonstrated in the Transport Assessment (Appendix 9.1), The Development will overall result in a reduction in traffic flows at key junctions on the adjacent highway network and key links such as the A512(T) in Shepshed, the A512(T) (east of the SUE site access), the A6(T) (towards Loughborough) and Epinal Way (north of the A512(T)). This is because the Strategic Link Road will result in a proportion of existing trips re-assigning from their existing routes onto the Strategic Link Road. Traffic modeling information obtained from LCC indicates that the Strategic Link Road will result in approximately 800 to 900 vehicles re-assigning from existing routes on to the Strategic Link Road in both the AM and PM peak hours. This demonstrates the significant Loughborough and Shepshed wide benefit that the Strategic Link Road (to be provided as part of the development) will bring. The one exception to this is at M1 Junction 23 where there is an increase in traffic but the increase is estimated to be less than 30%.

9.4 Cumulative Impacts

9.4.1 The forecast impacts are judged against the criteria outlined in the earlier Assessment Methodology and Assessment Criteria sections. This is undertaken as a two stage process; one prior to the implementation of mitigation measures and one following the implementation of mitigation measures. This section considers the impacts of the Development on the highway network without mitigation measures included. Later sections consider the impact with mitigation measures in place.

9.4.2 As agreed with the TWG, in order to obtain future year traffic flows, growth factors have been applied to the existing peak hour traffic flows to ascertain the future year traffic flows. In addition,

as agreed with the TWG, traffic flows from the following committed developments have been included in the assessment:

- Dishley Grange – planning application number P/08/2048/2 (employment);
- Hathern Road, Shepshed – planning application number P/13/1343/2 (70 residential dwellings);
- Shepshed Road, Hathern – planning application number P/10/1580/2 (62 residential dwellings – approximately 50% complete); and
- Loughborough Road, Hathern – planning application number P/10/0415/2 (58 residential dwellings – fully built out).

9.4.3 As outlined in the TA, the TA's associated with each of the above committed developments have been reviewed and the development traffic flows have been obtained. These flows have then been added to background traffic flows at each TA assessment year.

9.4.4 In addition, as agreed with the TWG, a cumulative test has been undertaken as a separate exercise at M1 Junction23, the A512(T) Site access and the A512(T)/Leicester Road/Ingleberry Road junction whereby traffic flows from the future University Science and Enterprise Park extension are added to the 2031 'with development' SUE flows. This is based on information in the emerging Core Strategy regarding the University Science and Enterprise Park Extension and represents the West of Loughborough Growth Area.

9.4.5 In addition, during pre-application discussions, future growth in Shepshed was discussed with the TWG. There are a number of planning applications currently under consideration in Shepshed and Shepshed is identified as an area of growth in the emerging Core Strategy. As agreed with the TWG, the cumulative impact of both the Development and future growth in Shepshed has been dealt with in a separate exercise by a sensitivity test. Traffic from the following planning applications (yet to be determined) have been added to the 2031 'with development' SUE flows:

- Oakley Road, Shepshed – planning application number P/13/1838/2 (32 residential dwellings);
- Tickow Lane, Shepshed – planning application number P/13/1826/2 (380 residential dwellings);
- Hallamford Road, Shepshed – planning application P/13/2054/2 (250 residential dwellings);
- Hathern Road, Shepshed – planning application number P/13/1641/2 (270 residential dwellings); and
- Tickow Lane, Shepshed – planning application number P/13/1751/2 (215 residential dwellings).

9.4.6 The TA for each of the above proposed developments has been reviewed and the development traffic flows have been obtained. These flows have been added to the background traffic flows at M1 Junction 23, the A512(T) site access and the A512(T)/Leicester Road/Ingleberry Road junction as part of a Shepshed sensitivity test.

Severance

9.4.7 Severance can be described as the perceived division that can occur within a community when it becomes separated by a major traffic artery. It may result from the difficulty of crossing a heavily trafficked road for example, or as a result of a physical barrier created by the road itself. However, there are no predictive formulae which give simple relationships between traffic factors and levels of severance. The IEMA guidelines suggest that severance can become an issue where a 10% increase in traffic flows is forecast.

9.4.8 As outlined earlier in this Chapter, the Development will overall result in a reduction in traffic flows at key junctions on the adjacent highway network and key links such as the A512(T) in Shepshed, the A512(T) (east of the proposed site access), the A6(T) (towards Loughborough) and Epinal Way (north of the A512(T)). This is because the Strategic Link Road will result in a proportion of existing trips re-assigning from their existing routes onto the strategic link. Overall, the Development, without the proposed mitigation improvements is therefore considered to have a limited direct impact on severance. In particular, this is because traffic from the Development will be distributed along roads which already accommodate heavy traffic and therefore any severance issues will already exist. Overall, the Development without the proposed mitigation improvements is thus considered to have a direct impact of long term **negligible adverse significance** on severance.

Driver Delay

9.4.9 The Transport Assessment (Appendix 9.1) forecasts an increase in traffic on roads in the vicinity of the Site. It is therefore concluded that the Development without the proposed mitigation improvements, is likely to increase driver delay at some locations. It is therefore concluded that the Development, without the proposed mitigation improvements, is considered to have a direct impact of long term **moderate adverse significance** on driver delay.

Pedestrian Delay

9.4.10 Changes in volume composition and speed of traffic can affect the opportunities available for pedestrians to cross the road. In general, an increase in traffic is likely to result in increased pedestrian delay. The forecast increased traffic on the road network without mitigation is likely to increase pedestrian delay at some locations. It is therefore concluded that the Development, without the proposed mitigation improvements, is considered to have a direct impact of long term **low adverse significance** on pedestrian delay.

Pedestrian Amenity

9.4.11 Pedestrian Amenity can be described as the relative ‘pleasantness’ of a journey and is affected by various factors; including traffic volume, traffic composition and standard of facilities available. Without the pedestrian facilities proposed as part of the Development, the SUE could be perceived to impact on pedestrian amenity in some locations. It is therefore concluded that the Development, without the proposed mitigation improvements, is considered to have a direct impact of long term **low adverse significance** on pedestrian amenity.

Fear and intimidation

9.4.12 The scale of fear and intimidation experienced by pedestrians is related to a number of factors including the volume of traffic, traffic composition, traffic speeds and the proximity of traffic to pedestrian movements and desire lines. Without the proposed mitigation improvements, it is unlikely that the Development would impact negatively on fear and intimidation issues because traffic from the Development will be distributed along roads which already accommodate heavy traffic and therefore any fear and intimidation issues will already exist. It is therefore concluded that the Development, without the proposed mitigation improvements, is considered to have a direct impact of long term **low adverse significance** on fear and intimidation.

Accidents and Safety

9.4.13 The IEMA guidelines recommend that thresholds should not be used when considering the significance of accidents and safety. This is due to the variation in highway conditions from one location to the next and the variation in potential factors causing Personal Injury Accidents.

9.4.14 Personal Injury Accident (PIA) data has been obtained from LCC for the most recently available 5 year period between 01.11.08 and 31.10.13 and analysis is presented in the Transport Assessment (Appendix 9.1). Based on this assessment, without the proposed mitigation improvements, it is unlikely that the Development would impact negatively on accidents and safety. It is therefore concluded that the Development, without the proposed mitigation improvements, is considered to have a direct impact of long term **negligible adverse significance** on accidents and safety.

9.5 Additional Mitigation, Compensation and Enhancement Measures

Mitigation Measures

9.5.1 A comprehensive package of off-site transport improvements is proposed as part of the Development. The emphasis will be on improvements for walking, cycling, equestrians and public transport. There will however, be some improvements which will benefit general traffic, including the provision of a new Strategic Link Road through the Site.

Walking/Cycling

9.5.2 The following walking, cycling and equestrian improvements are proposed within the Site:

- Proposed shared footway/cycleway adjacent to both sides of the proposed Strategic Link Road (between Coach Road and the A6(T)) and the southern side of the Hathern Road Link;
- Improvements to existing National Cycle Network route aligned east to west through the Site;
- Improvements to existing bridleway aligned east to west through the Site;
- Creation of a network of permeable walking, cycling and equestrian routes within Garendon Park; and
- Creation of a network of new walking, cycling and equestrian routes within the developable area providing safe, convenient and direct routes through the Site.

9.5.3 These improvements will provide a comprehensive network of walking, cycling and equestrian routes within the Site. Through provision of a network of walking, cycling and equestrian routes, several connections will be provided into existing areas of Loughborough and Shepshed as follows:

- A6(T) – walking, cycling and equestrian connections to the north of Loughborough providing access to the Dishley Grange consented employment Site and Bishop Meadow Industrial Estate;
- Black Brook – walking connection to Gorse Covert District Centre, Robert Bakewell Primary School and Loughborough Town Centre;
- Coe Avenue – National Cycle Route connection towards the University and Loughborough Town Centre;
- Thorpe Acre – walking connections to local destinations;
- Disused Railway Line – creation of a walking/cycling route towards the University and Loughborough Town Centre;
- Existing access to Garendon Park – open the existing private vehicle access to Garendon Park as a walking/cycling connection towards the future University Science and Enterprise Park Extension;
- Coach Road – open Coach Road as a walking/cycling connection to Shepshed;
- Butthole Lane - National Cycle Route connection to Shepshed / Loughborough;
- Bridleway connection to Hathern Road – key link for equestrians to local riding centres;
- Hathern Drive – creation of a walking/cycling route to the A6(T);
- Hathern Road connections – creation of a walking/cycling route and an additional walking route to Hathern Road; and
- Walking route to the north of the Site.

Bus Services

9.5.4 Bespoke bus services are proposed from first occupation of the Development. Once the Development is fully built out, a circular bus route will be provided between the Development and Loughborough Town Centre via Bishop Meadow Industrial Estate, Loughborough University and the Science Park. The service will operate a 30 minute frequency daytime Monday to Saturday and an hourly frequency evenings and Sundays.

9.5.5 In accordance with the 6Cs Design Guide, bus stops within the Development are proposed to ensure that '*generally walking distances to bus stops in urban areas should be a maximum of 400m'*.

Travel Plan and Smarter Travel Measures

9.5.6 A Travel Plan has been prepared in accordance with the guidelines in the DfT documents – 'Good Practice Guidelines: Delivering Travel Plans through the Travel Plan Process' and 'Making Residential Travel Plans Work: Good Practice Guidelines'. The Travel Plan includes

complementary measures to encourage walking, cycling, bus and car sharing as modes of transport such as:

- Appointment of a Travel Plan Co-ordinator to administer the Travel Plan;
- Web-based travel packs;
- Provision of relevant marketing Information;
- Subsidised bus transport for residents – to encourage greater bus use; and
- Monitoring of the Travel Plan against Travel Plan targets.

Highway Improvements

9.5.7 The proposed Strategic Link Road has significant Loughborough wide benefits in terms of existing traffic re-routing from existing routes on to the Strategic Link Road. The main exception to this is at M1 Junction 23 where there is a material increase in traffic as a result of the West of Loughborough Growth Area. Highway improvements have been identified to mitigate this impact for which contributions from the Development and the University Science and Enterprise Park Extension are required (and Shepshed developments subject to discussion with CBC/LCC). Mitigation is also required at the A512(T)/Epinal Way junction and the A6(T)/Bishop Meadow Road/Warwick Way junction which the Development will contribute fully to mitigate the Development's impact.

9.5.8 Based on a worst case 2031 highway capacity assessment (this assumes a modal share for the Site without taking into account the extensive walking, cycling and bus improvements as well as the supporting Travel Plan and Smarter travel initiatives), in order to mitigate the impact of the Development, the following capacity improvements are proposed:

- M1 Junction 23 – contribution towards fully signal controlled scheme following completion of 840 dwellings. The improvement scheme will operate within capacity at the 2031 assessment year i.e. following Development completion.
- A512(T) Site Access – contribution towards a signal controlled roundabout to serve the Development and the Science Park Extension following completion of 600 units.
- A512(T) – contribution towards dualling of the A512(T) between M1 Junction23 and the A512(T)/Snells Nook Lane junction following completion of 840 units. In all likelihood these works may need to be incorporated into the A512(T) Site Access works.
- A512/Epinal Way junction – re-sequencing of signals following completion of 840 dwellings. The improvement scheme will operate within capacity at the 2031 assessment year (i.e. following Development completion).
- A6(T)/Bishop Meadow Road/Warwick Way junction – introduce signal control on the Bishop Meadow Road arm of the junction and improve the lane allocations on the A6(T) (north) arm of the junction following completion of 840 dwellings. The improvement scheme will operate on a nil-detriment basis at the 2031 assessment year i.e. following Development completion.

9.5.9 Full details of the proposed mitigation strategy are presented in the Transport Assessment (Appendix 9.1) and Travel Plan (Appendix 9.2).

9.6 Assessment Summary and Residual Environmental Effects

Residual Impacts

Construction Phase

9.6.1 Construction is phased over a 16 year period with 120 dwellings constructed during the first three years of construction and 240 dwellings per year thereafter.

9.6.2 It is proposed that a Construction Traffic Management Plan (CTMP) will be implemented by the contractor to address the potential adverse effects of the construction on the local surrounding highway network in advance of construction. This will encompass all of the necessary measures required to ensure that works potentially affecting the highway are adequately addressed. It will provide a framework to help ensure that all necessary mitigation and remedial measures are in place to deal with these during the construction. In addition to the adoption of standard best practice approaches, a number of specific mitigation measures are discussed in more detail below which are considered necessary to address the potentially adverse impacts discussed above.

9.6.3 The CTMP will include the following measures:

- Highways to be kept clear of mud and debris.
- A construction phase delivery strategy to control the timing and routing of delivery vehicles; and
- Group transport to the Site for construction workers to reduce the number of private car trips.

9.6.4 It is considered that the number of construction vehicles accessing the Site, relative to the volume and character of vehicular traffic on the surrounding highway network, and the route which those vehicles take, will not have a significant impact on existing highway conditions.

9.6.5 The increase in traffic due to construction vehicles on the criteria, including severance, delay, amenity and safety would be low and the impact is considered to be a short term **low adverse significance**, and does not need to be considered further in this ES.

Operational Phase

9.6.6 In order to mitigate the traffic generated by the Development a comprehensive package of sustainable transport measures are to be provided. The operational phase of the Development with these improvements in place can be summarised under the following categories.

Severance

9.6.7 The Development, with the proposed mitigation improvements in place is considered to have an overall direct impact of long term **low beneficial significance** . This is because traffic from the

Development will be distributed along roads which already accommodate heavy traffic and therefore any severance issues will already exist and coupled with enhancements to crossing facilities and upgraded links to existing and proposed non-motorised routes will improve connectivity around the Site.

Driver Delay

9.6.8 The Transport Assessment (Appendix 9.1) forecasts an increase in traffic on roads in the vicinity of the Site. To mitigate this, highway improvements are proposed for West of Loughborough to ensure that the development has 'nil determent' upon the existing network. Furthermore, the proposed Strategic Link Road will have significant Loughborough and Shepshed wide benefits. It is therefore concluded that the Development is considered to have a direct impact of long term **low beneficial significance** on driver delay.

Pedestrian Delay

9.6.9 Changes in volume composition and speed of traffic can affect the opportunities available for pedestrians to cross the road. In general, an increase in traffic is likely to result in increased pedestrian delay. The forecast increased traffic on the road network without mitigation is likely to increase pedestrian delay at some locations, although this is offset by the proposed improved opportunities to cross the major roads around the Site as part of the cycling and walking measures. It is therefore concluded that the Development is considered to have a direct impact of long term **low beneficial significance** on pedestrian delay.

Pedestrian Amenity

9.6.10 Pedestrian Amenity can be described as the relative 'pleasantness' of a journey and is affected by various factors; including traffic volume, traffic composition and standard of facilities available. With the pedestrian facilities proposed as part of the Development, it is therefore concluded that the Development is considered to have a direct impact of long term **low beneficial significance** on pedestrian amenity.

Fear and intimidation

9.6.11 The scale of fear and intimidation experienced by pedestrians is related to a number of factors including the volume of traffic, traffic composition, traffic speeds and the proximity of traffic to pedestrian movements and desire lines. With the comprehensive package of pedestrian and cycling mitigation measures the Development is considered to have a direct impact of long term **low beneficial significance** on fear and intimidation issues.

Accidents and Safety

9.6.12 The proposed improvements will ensure that needs of vulnerable road users e.g. pedestrians and cyclists are accommodated and it is therefore considered that the Development will have a direct impact of long term **low beneficial significance** on accidents and safety.

9.7 Summary

9.7.1 This Chapter considers the potential impact from road traffic on environmental issues relating to the Development at West of Loughborough. It draws on analysis included in the associated

Transport Assessment (Appendix 9.1) to provide data for consideration and inclusion within this assessment.

9.7.2 Analysis included in the Transport Assessment (Appendix 9.1) identifies locations where the Development is estimated to have a material impact on existing highway conditions. A material impact is estimated along the A512(T) between M1 Junction 23 and Snells Nook Lane and at M1 Junction 23.

Mitigation Measures

9.7.3 Mitigation measures are outlined in the Transport Assessment (Appendix 9.1) and the Travel Plan (Appendix 9.2). Measures focus primarily on walking, cycling and public transport measures, although some highway capacity improvements are proposed.

Residual Impacts

9.7.4 The construction of the Development is programmed across a finite period of time and it is therefore considered that there will be no residual traffic impact on the highway network following completion of the construction phase.

9.7.5 Once the Development is fully operational a significant number of on and off-site mitigation measures will have been installed to encourage sustainable transport modes. It is considered that the development coupled with these proposals will have a direct impact of long term low beneficial significance upon severance; driver delay; pedestrian delay; pedestrian amenity; fear and intimidation; and accidents and safety.

9.8 Conclusion

9.8.1 The increase in traffic generated by the Development is not considered to be the root cause of forecast congestion. Notwithstanding the impact of the Development, a package of mitigation measures is proposed. This includes walking, cycling, public transport and highway capacity improvements.

References

Institute of Environmental Assessment, 1993, Guidelines for the Environmental Assessment of Road Traffic.

Highways Agency, Design Manual for Roads and Bridges Volume 11, Section 3 (Environmental Assessment Techniques)

10 ECOLOGY AND NATURE CONSERVATION

10.1 Introduction to the Assessment

10.1.1 This Chapter has been prepared by FPCR Environment and Design Ltd and presents an Ecological Impact Assessment in relation to the Development. The assessment identifies and evaluates the ecological, biodiversity and nature conservation interests, establishing the baseline information associated with the Development and evaluates the significance of any potential effects arising from the proposals upon these baseline conditions. Mitigation measures have been proposed where relevant, and the residual effects of the Development, taking account of proposed mitigation and enhancement measures are assessed. The potential for cumulative effects in combination with other proposed developments in the vicinity are also assessed. This assessment is required to ensure that all potential ecological impacts are identified and addressed as part of the Environmental Impact Assessment process.

10.2 Aims of the Assessment

10.2.1 The aims of the assessment are to:

- Record baseline information;
- Identify and evaluate the importance of ecological receptors and features of nature conservation value that could be affected by the Development;
- Identify and evaluate potential impacts on these receptors as a result of the Development and cumulative impacts in combination with other proposed developments;
- To assess the significance of the effects of these impacts;
- Propose appropriate avoidance, mitigation and compensation measures (referred to generally as mitigation) and enhancement measures in relation to the effects of the Development and the ecological features present; and
- Assess the residual impacts and effects of the proposals taking into account proposed mitigation and enhancements.

10.3 The Development

10.3.1 This Chapter should be read in conjunction with the Site description and the description of the Development as set out in Chapter 2 of this ES.

10.3.2 The Site consists of primarily arable agriculture and areas of horse grazing. Areas of woodland are present, particularly in the south of the Site, which is Site of Garendon Park. Garendon Park also includes some areas of cattle grazed pasture, a lake (Hermitage Lake) and a number of historical buildings. The Black Brook runs west to east across the Site, separating the northern section from the central area and Garendon Park in the south. A smaller stream, the Shortcliff Brook, is also present in the south of the Site and the stream south of Oxley Gutter runs east from its source in woodland within north-east of Garendon Park.

10.3.3 The Development consists of up to 3,200 residential dwellings, commercial/employment development and associated green-spaces and infrastructure, including a Strategic Link Road, Green Infrastructure networks and restoration of Garendon Park.

10.3.4 The Development will be constructed within the northern and central sections of the Site; Garendon Park being retained and restored for public use. Existing buildings within the Park will be used to provide the necessary visitor facilities.

10.3.5 The development will be served by a new Strategic Link Road that will provide access from the A512(T) New Ashby Road in the south and the A6(T) in the north-east, with a link to the B588 Hathern Road in the north-west.

10.4 Scope of Assessment

10.4.1 In order to determine the appropriate scope for this assessment, a Scoping Report was produced in March 2014. Responses to the Scoping Report were sought from Charnwood Borough Council, Natural England and the Environment Agency. As a result of this consultation process, it was agreed that the scope of assessment would include:

- Desk study;
- Ecological Field Surveys; and
- Ecological Impact Assessment.

Desk Study

10.4.2 The desk study includes:

- Identification of statutory and non-statutory designated sites for nature conservation;
- Consultation with the local biological records centre for records of legally protected and notable species and habitats; and
- A review of previous survey data.

Field Surveys

10.4.3 Ecological field surveys includes:

- Extended Phase 1 habitat survey, including survey for evidence for protected species;
- Detailed botanical surveys of habitats potentially notable botanical value;
- Assessment of trees and buildings for potential to support roosting bats;
- Bat activity (transect and static detector) surveys;
- Great crested newt *Triturus cristatus* surveys;
- Badger *Meles meles* surveys and bait-marking study;
- Reptile surveys;

- Water vole *Arvicola amphibius* surveys;
- Otter *Lutra lutra* surveys;
- White-clawed crayfish *Austropotamobius pallipes* surveys;
- Wintering bird surveys; and
- Breeding bird surveys.

Ecological Impact Assessment

10.4.4 Assessment of impacts follows guidelines on Ecological Impact Assessment from the Chartered Institute of Ecology and Environmental Management (CIEEM)[3]. This includes assessment of potential cumulative impacts.

10.5 Legislation and Policy Context

10.5.1 Details of the broader policy context for the Development are set out in Chapter 4. Legislation and specific policies relevant to wildlife protection and nature conservation are outlined below.

Wildlife and Countryside Act 1981, (as amended)

10.5.2 National legislation for the protection of selected species is provided in the Wildlife and Countryside Act 1981, (as amended). Under Section 1(1) and 1(2) all British bird species, their nests and eggs (excluding some pest and game species) are protected from intentional killing, injury or damage. Under Sections 1(4) and 1(5), special penalties are applied to bird species included in Schedule 1 of the Act and protection is extended for these species to disturbance whilst building, in or near a nest and disturbance to dependent young. Schedule 5 provides special protection to animal species other than birds and through paragraph 9(4) of the Act, against damage to "any structure or place which any wild animal (included in the schedule) uses for shelter and protection" and against disturbance whilst in such places. The CRoW Act 2000 amends Section 1(5) of the Wildlife and Countryside Act 1981 by introducing a new offence of "reckless" disturbance to protected wildlife and making certain offences punishable by imprisonment.

Conservation of Habitats and Species Regulations 2010 (as amended)

10.5.3 Additional protection is afforded to a number of species through their inclusion on Schedule 2 of the Conservation of Habitats and Species Regulations 2010, which transpose into British law the European Community's Habitats Directive (92/43/EEC) (Great Britain, Parliament, 2010). The Regulations extend protection against deliberate disturbance to those species wherever they are present, and provides tests against which the permission for a development that may have an effect on a Schedule 2 protected species must be assessed before permission can be given through a licence.

---

[3] IEEM (2006) *Guidelines on Ecological Impact Assessment in the United Kingdom*. Institute of Ecology and Environmental Management

10.5.4 Where licenced works will be required, it will be necessary to demonstrate that the proposed development meets a purpose of 'preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment'. In addition it must be demonstrated that:

(a) 'there is no satisfactory alternative'; and

(b) 'the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'.

The Protection of Badgers Act 1992

10.5.5 The Protection of Badgers Act 1992 (Great Britain, Parliament, 1992) provides protection to badgers and their setts. This legislation is primarily concerned with animal welfare issues and the need to protect badgers from activities such as baiting and deliberate harm. The Act makes it an offence to:

- Wilfully kill, injure, take, possess or cruelly ill-treat a badger, or attempt to do so;
- To intentionally or recklessly interfere with a sett (this includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it).

Hedgerow Regulations 1997

10.5.6 The Environment Act 1995 provides legislation for the protection of certain hedges in England and Wales. These are defined in the Hedgerow Regulations 1997 that prevent the removal of most countryside hedgerows without first submitting a hedgerow removal notice to the local planning authority. Local Planning Authorities are able to order the retention of 'important' hedgerows (but not others). The Regulations set out criteria to be used by the Local Planning Authority in determining which hedgerows are important.

Habitats and Species of Principal Importance

10.5.7 Under Section 40 of the Natural Environment and Rural Communities Act 2006 (NERC), every public authority has a duty to have due regard biodiversity as far as is consistent with the proper exercise of their function. Section 41 of NERC lists the 'Habitats and Species of Principal Importance.' In England, these are all the habitats that were identified as requiring action in the UK Biodiversity Action Plan (UK BAP) and are referred to as Priority Species and Habitats in the subsequent Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011) and UK Post-2010 Biodiversity Framework (DEFRA, 2012).

Biodiversity Action Plans

10.5.8 In addition to the national biodiversity strategies (DEFRA 2011 and 2012), local Biodiversity Action Plans (BAPs) identify habitats and species of nature conservation concern and set out objectives to improve their conservation status, together with actions to fulfil these objectives.

10.5.9 The Site is covered by the Leicester, Leicestershire and Rutland BAP (LLRBAP), which provides further indication of the relative value given to existing habitats and species and have been used when assessing the value of the habitats and species present within the Site.

National Planning Policy Framework March 2012

10.5.10 The National Planning Policy Framework (NPPF), supported by the PPG – Natural Environment (section 2 – Biodiversity, Ecosystems and Green Infrastructure), provides Natural Environment objectives which state that:

"The planning system should contribute to and enhance the natural and local environment by:

- *protecting and enhancing valued landscapes, geological conservation interests and soils;*
- *recognising the wider benefits of ecosystem services;*
- *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate."*

"When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- *if significant harm 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;*
- *proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;*
- *development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
- *opportunities to incorporate biodiversity in and around developments should be encouraged; and*
- *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss."*

10.5.11 The PPG provides guidance on how these objectives should be implemented by planning authorities and emphasises the objective that planning should seek to minimise impacts on biodiversity and provide net gains in biodiversity. In this respect Paragraph 18 of Section 2 of the PPG states that:

"Biodiversity enhancement in and around development should be led by a local understanding of ecological networks, and should seek to include:

- *habitat restoration, re-creation and expansion;*
- *improved links between existing sites;*
- *buffering of existing important sites;*
- *new biodiversity features within development; and*
- *securing management for long term enhancement.*

10.5.12 The Government Circular 'Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System' (ODPM, 2005b) was written to accompany Planning Policy Statement 9 (PPS9). PPS9 has now been superseded by the NPPF (March 2012) however, the circular still remains an active document referred to by the NPPF and states that the presence of a protected species is *"… a material consideration when a planning authority is considering a development proposal which, if carried out, would be likely to result in harm to the species or its habitat"*, as well as highlighting that "… *any necessary measures to protect the species should be in place, through conditions and/or planning obligations, before the permission is granted".*

Charnwood Local Plan 2006 to 2028 Core Strategy Pre-Submission Draft (June 2013)

10.5.13 The Charnwood Core Strategy was submitted to the Secretary of State on the 20th December 2013 for independent Examination.

10.5.14 The emerging Core Strategy sets out the Council's proposals to guide future development in the Borough. It is consistent with the National Planning Policy Framework. The emerging Core Strategy seeks to accommodate approximately 10,000 additional dwellings within the Borough, together with places of work, shops, community buildings and green spaces between 2012 and 2028. It will include policies on housing, employment, retail, environmental assets, design, transport and other related issues.

<u>Policy CS 12 - Green Infrastructure</u>

We will protect and enhance our green infrastructure assets for their community, economic and environmental values.

We will work with our partners to define, protect and enhance the Charnwood Forest Regional Park and support the aims of the National Forest Strategy by:

- *Supporting the woodland economy, rural diversification, including sustainable and green tourism which protects and enhances the distinctive Charnwood Forest landscape;*
- *Seeking planting from developments that are within the Charnwood Forest Regional Park that meet National Forest Planting Guidelines; and*
- *Securing green links between developments and the Charnwood Forest*

We will support proposals that relate to the River Soar and Grand Union Canal Corridor which:

- *Provide high quality walking and cycling links between the corridor and our towns and villages;*

- *Deliver hubs and other high quality tourism opportunities linked to the River Soar at Loughborough, Barrow upon Soar and Thurmaston; and Protect and enhance water bodies and resources.*

We will protect and enhance our Urban Fringe Green Infrastructure Enhancement Areas by:

- *Enhancing our network of green infrastructure assets through strategic developments in accordance with Policies CS19, CS20, CS21, CS22, CS23 and CS24;*
- *Addressing the identified needs in open space provision; and Supporting development in Green Wedges that:*

  a) retains the open and undeveloped character of the Green Wedge;

  b) retains and create green networks between the countryside and open spaces within the urban areas; and

  c) retains and enhances public access to the Green Wedge, especially for recreation.

Policy CS 13 - Biodiversity and Geodiversity

"We will conserve and enhance our natural environment for its own value and the contribution it makes to our community and economy. We will do this by:

Supporting developments that protect biodiversity and geodiversity and those that enhance, restore or re-create biodiversity. We will expect development proposals to consider and take account of the impacts on biodiversity and geodiversity, particularly with regard to:

- *Sites of Special Scientific Interest*
- *Local Wildlife Sites*
- *Regionally Important Geological Sites*
- *UK and Local Biodiversity Action Plans priority habitats and species*
- *Protected species and*
- *Ecological networks*

We will only support development that results in the loss of ecological or geological features in exceptional circumstances where the benefit of development clearly outweighs the impact on ecology and geodiversity.

Where there are impacts on biodiversity we will require adequate mitigation; or as a last resort, compensation which results in replacement provision that is of equal or greater value and potential than that which will be lost, and is likely to result in a net gain in biodiversity.

We will consider this by requiring development proposals to be accompanied by ecological surveys and an assessment of the impacts on biodiversity and geodiversity.

We will also work with our partners to secure long term management and investment plans for biodiversity and geodiversity.

10.5.15 The emerging Core Strategy includes the following paragraphs relating to the West of Loughborough SUE:

10.29 The area includes a number of key wildlife corridors which are part of the network connecting the Charnwood Forest to the Soar Valley. These corridors are associated with the Black Brook, Hathern Drive, a series of woodlands along the western edge of Loughborough joining a disused railway line and links from these corridors into the Hermitage Local Wildlife Site.

10.30 We expect the development to respect and enhance these wildlife corridors for their important biodiversity value and, where appropriate, create new wildlife networks. There are opportunities to create a network across the landscape along the north-south and west-east axis. There is an opportunity to re-connect isolated ecological sites, such as the Site of Special Scientific Interest at Oakley Wood. Activities that have the potential to disrupt wildlife should be focussed elsewhere in the site.

We expect biodiversity, open space and climate change to be considered and planned in an integrated manner together with walking and cycling links.

10.5.16 Policy CS 22 of the emerging Core Strategy states:

The sustainable urban extension will create a balanced community and a safe, high quality and accessible environment. We will do this by: […] Protecting and enhancing existing wildlife corridors and where appropriate, provide new corridors to create a coherent biodiversity network in accordance with Policy CS13; […]

10.5.17 Appendix 3 of the emerging Core Strategy provides the Charnwood Monitoring Framework, which states the Policy CS 13 Key Indicators:

- *No net reduction in BAP priority habitats and species*
- *No net reductions in areas designated for their value as SSSI/LWS/RIGS and locally designated sites*
- *Net increase in habitat creation over plan period*

10.6 Methodology

Desk Study

10.6.1 In order to compile existing baseline information, relevant ecological information was requested from:

- Leicestershire and Rutland Environmental Records Centre (LRERC) (this includes data held by the Leicestershire and Rutland Wildlife Trust);
- Leicestershire Amphibian and Reptile Network;
- Loughborough Naturalists Club; and
- Leicestershire and Rutland Badger Group.

10.6.2 Information was gathered from the Multi Agency Geographic Information for the Countryside (MAGIC) website. 1:25,000 scale Ordnance Survey maps and aerial photographs were also inspected in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside, such as ponds and areas of ancient woodland.

10.6.3 The search area for biodiversity information is related to the significance of sites and species and potential zones of influence, as follows:

- 5km around the Site for sites of International Importance (e.g. Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site) and for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest (SSSI))
- 1km around the Site for sites of County/Local Importance (e.g. Sites of Importance for Nature Conservation (SINC), Wildlife Sites (WS), Local Nature Reserves (LNR)) and species records (including protected species, species of principal importance for nature conservation under the Natural Environment and Rural Communities (NERC) Act 2006, local biodiversity action plan (LBAP) or notable species)

10.6.4 In addition, data from ecological surveys previously undertaken at the Site were reviewed to extract relevant baseline information.

Ecological Surveys

10.6.5 Baseline surveys carried out in relation to the assessment topics identified above are summarised in Table 10.1. Further details of the methodology used for these assessments are presented in the specific Ecological Survey Reports in Appendices 10.1 -10.10.

Table 10.1 Summary of Ecological Baseline Surveys

Assessment Topic	Details of surveys undertaken
Habitats and flora	Extended Phase 1 habitat surveys were carried out in July to September 2013 following standard Phase 1 Habitat Survey Methodology (JNCC 1993, revised 2003). Assessments of hedgerows against the wildlife and landscape criteria of the Hedgerow Regulations 1997 (Statutory Instrument No: 1160) and Hedgerow Evaluation and Grading Systems (HEGS) (Clements & Toft, 1993). Detailed botanical (Phase 2) surveys of habitats identified as likely to be of significant botanical interest or diversity were carried out in 2013 (British Plant Communities, Rodwell 1991). Habitats have also been assessed against the criteria for selection of Wildlife Sites[4] and BAP habitats.

[4] Guidelines for the selection of Local Wildlife Sites in Leicester, Leicestershire and Rutland, Leicestershire County Council, 2011

Badgers	Badger surveys of the Site were carried out in 2012 following the methodology in Surveying Badgers (Harris, Cresswell & Jeffries, 1989). Bait marking surveys were carried out September to October 2013 to determine the extent of badger territories and movements within the Site.
Bats	Monthly bat activity surveys and static bat detector surveys were carried out between June and October 2013 following methodology in Bat Surveys - Good Practice Guidelines (Bat Conservation Trust, 2012). Trees likely to be affected by the Development were assessed and where necessary inspected for potential to support bat roosts in September 2013 following the methodologies in Bat Surveys - Good Practice Guidelines (Bat Conservation Trust, 2012). Buildings within the Site were assessed for potential to support roosting bats in December 2013 following the methodology in Bat Surveys - Good Practice Guidelines (Bat Conservation Trust, 2012).
Birds	Breeding bird surveys were carried out in April, May and July 2013 following Common Bird Census recording methodology (Bird Census Techniques, Bibby et al, 2000). Wintering bird survey were undertaken between November 2011 and February 2012 (Bird Census Techniques, Bibby et al, 2000);
Great crested newts	Great crested newt surveys were carried out on potentially suitable waterbodies within 500m of the Site in April to June 2013 following Great Crested Newt Mitigation Guidelines (English Nature, 2001). These waterbodies included the Lake, ponds in the Stonebow Washlands 65m east of the Site and ditches within the Site holding standing water at the time of survey.
Reptiles	Artificial refuge surveys for reptiles were carried out in areas identified as providing suitable habitats between August and early October 2013, following methodology in the Reptile Mitigation Guidelines (Natural England , 2011) and Advice Sheet 10 – Reptile Survey (Froglife, 1999)
Otters	Otter surveys of the Black Brook running through the Site, the Lake and associated wet woodland area as well as connecting ditches and the full length of the Shortcliff brook running through the Site were carried out in November 2013 when river levels had been constant due to low rainfall. This ensured that evidence of Otter activity such as spraints and footprints had not been washed away by rising river levels. Surveys followed methodology in Monitoring the Otter (Chanin P., 2003).
Water voles	Water vole survey of Black Brook, Shortcliff Brook and the Brook south of Oxley Gutter were carried out in November 2013 following the methods in the Water Vole Conservation Handbook (Strachan and Moorhouse, 2006).
White-clawed crayfish	White-clawed crayfish surveys of Black Brook, Shortcliff Brook and the Brook south of Oxley Gutter were carried out in October 2013 following methodology in Monitoring the White-clawed Crayfish (Peay S., 2003).

Impact Assessment

10.6.6 The assessment has been undertaken with reference to current best practice and in particular the CIEEM guidelines for Ecological Impact Assessment.

Nature Conservation Evaluation

10.6.7 Features likely to be important in terms of biodiversity will be identified and evaluated on a geographical scale of importance ranging from International to Site level importance. The CIEEM guidance has identified various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity. These include:

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

10.6.8 Determination of nature conservation value also takes account of the status of species and habitats listed on Section 41 of the NERC Act as Habitats and Species of Principal Importance for Nature Conservation as well as published status lists including Red Data Book lists and Birds of Conservation Concern. Wildlife legislation is also taken into account in respect of protected sites and species.

10.6.9 The sensitivity of features subject to potential impacts will be determined based on the nature conservation value of the feature and its vulnerability.

10.6.10 The geographical frames of reference used for evaluation of features are outlined in Table 10.2.

Table 10.2 Geographic Frames of Reference for Evaluation of Nature Conservation Value

Level of Value	Examples
International	– An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biogenetic Reserve) or an area which meets the published selection criteria for such designation, irrespective of whether or not it has yet been notified. – A viable area of a habitat type listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of a larger whole. – Any regularly occurring population of an internationally important species, which is threatened or rare in the UK (i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10 km squares in the UK) or of uncertain conservation status or of global conservation concern in the Biodiversity 2020 strategy. – A regularly occurring, nationally significant population/number of any internationally important species.
National	– A nationally designated site (SSSI, NNR, Marine Nature Reserve) or a discrete area, which meets the published selection criteria for national designation (e.g. SSSI selection guidelines) irrespective of whether or not it has yet been notified. – A viable area of a priority habitat identified in the UK BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole. – Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (local BAP). – A regularly occurring, regionally or county significant population/number of any nationally important species. – A feature identified as of critical importance in the Biodiversity 2020 strategy.
Regional	– Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat which are essential to maintain the viability of a larger whole. – Viable areas of key habitat identified as being of Regional value in the appropriate Natural Area profile. – Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10 km squares in the UK or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation. – A regularly occurring, locally significant number of a regionally important species. – Sites which exceed the County-level designations but fall short of SSSI selection guidelines, where these occur.
County	– Semi-natural ancient woodland greater than 0.25 ha. – County/Metropolitan sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves selected on County/Metropolitan ecological criteria (County/Metropolitan sites will often have been identified in local plans). – A viable area of habitat identified in County BAP. – Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan “red data book” or BAP on account of its regional rarity or localisation. – A regularly occurring, locally significant number of a County/Metropolitan important species.

Level of Value	Examples
District	– Semi-natural ancient woodland smaller than 0.25 ha. – Areas of habitat identified in a sub-County (District/Borough) BAP or in the relevant Natural Area profile. – District sites that meet the published ecological selection criteria for designation, including Local Nature Reserves selected on District/Borough ecological criteria (District sites, where they exist, will often have been identified in local plans). – Sites/features that are scarce within the District/Borough or which appreciably enrich the District/Borough habitat resource. – A diverse and/or ecologically valuable hedgerow network. – A population of a species that is listed in a District/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation. – A regularly occurring, locally significant number of a District/Borough important species during a critical phase of its life cycle.
Local	– Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or neighbourhood (e.g. species-rich hedgerows). – Local Nature Reserves selected on Parish ecological criteria.
Site	– Areas of habitat which are considered to have value at an immediate level only and which are not considered to be of value outside of their immediate zone of influence

Assessment of Effects

10.6.11 The assessment of the potential effects of the Development takes into account of the effect of impacts that occur on-site and those that may occur to adjacent and more distant ecological features. Impacts can be permanent or temporary. Examples of potential impacts include, but are not restricted to: loss; damage; pollution, and severance of habitats; environmental changes (e.g. hydrology and air quality); and isolation, disturbance and killing or injury of fauna.

10.6.12 When determining impacts, reference is made to the parameters described in Table 10.3.

Table 10.3 Parameters used to determine impacts

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

10.6.13 In order to determine whether the effects of changes to the baseline conditions are significant, it is necessary to assess whether or not an impact will result in an effect (negative or positive) on the integrity of a defined site or ecosystem and/or the conservation status of a habitat or species within a given geographical area (IEEM, 2006).

10.6.14 The integrity of a Site is determined as "*the coherence of the ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified."*

10.6.15 For habitats, conservation status is determined by "*the sum of influences acting on the habitat and its typical species, that may affect its long term distribution, structure and functions as well as the long term survival of its typical species within a given geographical area*."

10.6.16 For species, conservation status is determined by "*the sum of influences acting on the species concerned that may affect the long term distribution and abundance of its population within a given geographical area."*

10.6.17 Once an effect is considered to be significant then the scale of impact is assessed on a geographical scale.

10.6.18 The likelihood that a change/ activity will occur as predicted has a degree of confidence assigned based on the estimated probability, i.e.: Certain/Near-Certain (95% chance or higher); Probable (below 95% but above 50%); Unlikely (below 50% but above 5%); and Extremely Unlikely (less than 5%).

10.7 Limitations to Assessment

10.7.1 Ecological surveys are necessarily limited by a number of variable factors that can affect the presence and behaviour of species at any given time. Therefore, while surveys were undertaken at the optimal times of year and following appropriate best practice, the ecological surveys are not intended to produce a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. However, the results of this survey have been sufficient to undertake the Ecological Impact Assessment and have allowed a sound evaluation of ecological receptors within the zone of influence, together with an assessment of the significance of any effects of the Development and the likely requirements for mitigation.

10.7.2 Where specific difficulties have been encountered in carrying out surveys, details are provided in the corresponding survey reports. No constraints were encountered that would significantly affect the ability to carry out the Ecological Impact Assessment.

10.8 Baseline Information

Designated Sites

Statutory Designated Sites

10.8.1 No statutory designated sites for nature conservation are present within or immediately adjacent to the Site.

10.8.2 No internationally designated sites are present within 5km of the Site.

10.8.3 Nationally designated sites within 5km of the Site are summarised in Table 10.4. Citations for these designations are provides in Appendix 10.1. The locations of these sites are shown on Figure 10.1.

Table 10.4 Nationally Designated Sites

Designated Site	Reasons for Designation	Distance to Site/ Size
Oakley Wood SSSI	Woodland habitat, transitional from mixed oakwood, on free-draining acid soil, to ash-hazel woodland characteristic of heavy clays	150m NW of site, 48.99ha
Newhurst Quarry SSSI	Designated for geological interest	630m SW of site, 9.1ha
Ives Head SSSI	Designated for geological interest	1.8km SW of site, 4.97 ha
Beacon Hill, Hangingstone & Outwoods SSSI	Important breeding bird assemblage and stands of ancient semi-natural alder woodland	1.5km SE of site, 140.8ha
Blackbrook Reservoir SSSI	Mesotrophic lake with unusual plant community, white-clawed crayfish and notable waterfowl.	2.8km SW of site, 39.36ha
Cotes Grassland SSSI	Notable grassland	4.3km NE of site, 3.25ha
Charnwood Lodge SSSI & NNR	Moorland heath, woodland and wetland habitats and geological interest.	3.4km SW of site, 27.1 ha
Loughborough Meadows SSSI	Unimproved alluvial flood meadow	2.3km NE of site, 60.52ha
One Barrow Plantation SSSI	Designated for geological interest	2.9km SW of site, 1.87ha
Ulverscroft Valley SSSI	Permanent grassland, heath, woodland and wetlands, which in combination produce one of the best wildlife sites in Leicestershire	4.9km S, 110.75ha
Shepshed Cutting SSSI	Site destroyed (Geological interest)	2.8km W, 5.87ha
Holly Rock Fields SSSI	Species-rich neutral grassland.	4.9km SW, 3.95ha
Grace Dieu And High Sharpley SSSI	One of the best remaining examples of the formerly extensive Charnwood Forest heaths. It includes woodland, scrub, heath, acid grassland and rock	4.1km W, 86ha

Non-Statutory Designated Sites

10.8.4 Non-statutory designated sites occurring within the Site include the Black Brook Local Wildlife Site (LWS) and Hermitage Estate LWS. The Black Brook LWS includes the Black Brook and river margins. The Hermitage Estate LWS includes wet woodland, semi-natural broadleaf woodland, semi-improved grassland, a lake and hedgerow.

10.8.5 These sites and other Local Wildlife Sites with potential to be affected by the Development are summarised in Table 10.5. The locations of these sites are shown on Figure 10.1.

Table 10.5 Local Wildlife Sites

Designated Site	Distance to the Site/ Size
Black Brook LWS	c. 3.4ha within Site (total area 10.86ha)
Hermitage Estate LWS	10.51ha within Site
Stonebow Washlands LWS	Adjacent to Site - 7.4ha
Booth Wood LWS	Adjacent to Site - 4.23ha
Hathern Road Verge (east side) Candidate LWS	Adjacent to Site - 0.21ha

10.8.6 Prior to the designation of local wildlife sites in Leicestershire, sites of value for nature conservation were designated according to their status as parish, district or county sites. These sites have been superseded by the Local Wildlife Sites, however they may still represent areas of notable habitats. Where these sites occur within the Site, these are summarised in Table 10.6.

Table 10.6 Historical Non-Statutory Designated Sites

Designated Site	Description	Size
Hathern Drive Parish Level Site	Linear woodland along either side of Hathern Drive, a green lane	2.96ha (total area 4.55ha)
Baileys Plantation Parish Level Site	Historic plantation woodland (over 120 years old)	6.35ha
Pear Tree Lane Parish Level Site	Wooded green lane	1.43ha
Woodland near the Obelisk Parish Level Site	Broadleaved plantation and naturally regenerated woodland	1.38ha
Home Covert District Level Site	Historic plantation woodland (over 120 years old)	10.38ha
Dismantled Railway Line Parish Level Site	Secondary woodland and scrub along disused railway embankment	1.94ha

Habitats and Flora

10.8.7 The Site as a whole is largely dominated by arable land bounded by hedgerows. Linking these sections are a range of established habitats and semi-natural features including substantial areas of broadleaved, plantation and wet woodland, scattered mature trees (including those associated with the former parkland), areas of open semi-improved grassland and compartments of open water and reed-beds. In addition to the above, the Site includes streams and wet ditches including the Black Brook which flows through the centre of the Site; dividing the Site in the north and south. Structures and buildings are scattered across the central and southern sections which are largely associated with the former parkland and farms situated within the Site boundary.

10.8.8 Habitats occurring within the Site are summarised in Table 10.7. These habitats are described below, with full details provided in Appendix 10.2 and Appendix 10.3. The locations of these habitats are shown on Figure 10.2.

Table 10.7 Summary of Habitats and Biodiversity Features

Habitat/ Feature	Quantity within the Site	Status	Nature Conservation Value
Semi-natural broadleaf woodland	18.27ha	Habitat of Principal Importance - *Lowland Mixed Deciduous Woodland* (S41 NERC) Habitat of national importance - *Broadleaf Woodland* (LLRBAP) Includes approximately 5.1ha of the Hermitage Estate LWS.	County
Wet woodland	3.40ha	Habitat of Principal Importance - *Wet Woodland* (S41 NERC) Habitat of national importance - *Wet Woodland* (LLRBAP) Includes approximately 1.7ha of Hermitage Estate LWS and approximately 1.7ha which potentially meets LWS criteria.	County
Broadleaf plantation	33.94ha	LLRBAP includes objective to create new broadleaf woodland	Local
Mixed plantation	14.93ha	-	Local
Overall woodland resource	70.54ha	-	County
Scrub	2.31ha	-	Site
Veteran, mature and notable trees	187 individual trees and 39 tree groups	Habitat of local importance – *Mature Trees* (LLRBAP) 21 trees potentially meet LWS criteria	District
Other trees	62 individual trees and 57 tree groups	-	Local
Semi-improved grassland	6.44	Habitat of Principal Importance - *Lowland Meadows* (S41 NERC) Habitat of national importance - *Neutral Grassland* (LLRBAP) Includes approximately 2.2ha of the Hermitage Estate LWS	Local-County
Poor semi-improved grassland	36.47ha	-	Site
Improved grassland	4.18ha	-	Negligible
Marshy grassland	0.73ha	-	Site
Ruderal	4.62ha	-	Site

Habitat/ Feature	Quantity within the Site	Status	Nature Conservation Value
Open standing water (Hermitage Lake, ha-ha)	1.28ha	Habitat of Principal Importance - *Eutrophic Standing Waters* (S41 NERC) Habitat of national importance - *Eutrophic Standing Waters* (LLRBAP)	Local
Black Brook	1.22ha	LWS Habitat of Principal Importance - *Rivers* (S41 NERC)	County
Shortcliff Brook	0.20ha	-	Local
Stream through wet woodland	0.12ha	-	Local
Arable	391.25ha	-	Site
Hedgerows – High value (Priority under HEGS and/or 'Important' under regulations and/or meet LWS criteria)	12.72km	Habitat of Principal Importance - *Hedgerows* (S41 NERC), Habitat of national importance - *Hedgerows* (LLRBAP) Certain hedgerows are Important under Hedgerow Regulations Two hedgerows form part of Hermitage Estate LWS, one additional hedgerow identified as likely to meet LWS criteria	District
Hedgerows – Low value	6.55km	Habitat of Principal Importance - *Hedgerows* (S41 NERC), Habitat of national importance - *Hedgerows* (LLRBAP)	Local
Ditches and drains (including Oxley Gutter)	0.91ha	-	Site
Buildings and hardstanding	5.56ha	-	Negligible

Trees

10.8.9 There are a number of mature and notable trees within the Site. Details of the trees present are provided in the Arboricultural Report (Appendix 10.11).

10.8.10 Mature trees are of considered to be important as they can provide habitat for a range of species of invertebrates, nesting birds and roosting bats and are generally irreplaceable except in the very long term. In addition, many mature trees have a significant component of dead wood, which is particularly important for a range of invertebrates, which in turn provide food for birds.

10.8.11 Trees are scattered across the Site, within hedgerows and as individual standards and tree lines along roads and ditches. Hedgerow trees generally comprise ash *Fraxinus excelsior* and

pedunculate oak *Quercus robur*. Pear Tree Lane and Hathern Drive are tree-lined including semi-mature and occasional mature specimens comprising a mix of beech *Fagus sylvatica*, ash, pedunculate oak and elm *Ulmus sp*. Scattered standards and groups of mature trees, forming part of the original parkland planting, are present in the centre of the Site and included a mix of native and ornamental species, with oak *Quercus sp.*, sweet chestnut *Castanea sativa*, yew *Taxus baccata* and beech.

10.8.12 In addition to the above, an avenue of semi-mature trees divides arable fields within Garendon Park of the Site leading to the Temple of Venus. Trees here are evenly spaced and include Norway maple *Acer platanoides*, larch *Larix decidua*, pedunculate oak and turkey oak *Quercus cerris*, crab apple *Malus sylvestris* and wild cherry *Prunus avium* trees.

10.8.13 The banks of the Black Brook also support a number of mature trees including alder *Alnus glutinosa*, crack willow *Salix fraglis* and sycamore *Acer pseudoplatanus*.

10.8.14 Twenty-one trees have been identified as potentially meeting the LWS selection criteria due to their size and the presence of features of biodiversity interest including dead wood and heart-rot.

10.8.15 Locations of veteran, mature and otherwise ecologically notable trees are shown on the Phase 1 Habitat Plan (Figure 10.2). Further details of trees with potential to support roosting bats are presented under Bats, below.

10.8.16 Mature trees are irreplaceable in the short-to-medium term and provide an important habitat resource. As such the trees within the Site are considered to be of district nature conservation value.

Woodland

Semi-Natural Broadleaf Woodland

10.8.17 The majority of the trees on Site form mature broadleaved woodland blocks and belts, comprising a mix of plantations and more natural secondary woodland areas. These features provide valuable habitat connections for movement of fauna both within the Site and wider area.

10.8.18 The three main areas of semi-natural broadleaved woodlands within the Site boundary are Home Covert situated within the south of the Site, Baileys Plantation located close to the eastern boundary extending from Black Brook to Pear Tree Lane and the Hermitage Estate LWS woodland. These woodlands are not classified as 'Ancient Semi-Natural Woodland', but appear to be largely mature plantations, established for well over 120 years and exhibiting semi-naturla scrub and ground flora.

10.8.19 Canopy species within these woodlands include mature oak, sycamore, ash, lime *Tilia x europaea* and beech with a variable and well established ground flora including bluebell *Hyacinthoides non-scripta*, wood avens *Geum urbanum,* bracken *Pteridium aquilinum* and common male fern *Dryopteris filix-mas*. Where the canopy is more open, holly *Ilex aquifolium*, field maple *Acer campestre* and elder *Sambucus nigra* stands are also present within the under-storey. Occasional rhododendron *Rhododendron ponticum* (WCA-9[5]) is also present within

[5] Wildlife and Countryside Act 1981 (as amended), Schedule 9 (invasive non-native species)

Home Covert. These woodlands are linked to the wider area by numerous tree blocks and belts which often comprise additional species such as silver birch *Betula pendula*, poplar *Populus sp*. and wych elm *Ulmus glabra*. These woodlands contain less-mature trees at their margins and support a number of grassy rides, which provide high quality foraging and commuting habitat for the local bat, bird and invertebrate populations.

Plantation Woodland

10.8.20 Several blocks of broad-leaved and mixed (broad-leaved and coniferous) plantation woodlands are present within the Site boundary including a wide belt of woodland cover along the south-eastern boundary and occasional blocks/belts within the Garendon Park area linking Home Covert with the central sections of woodland within The Hermitage. Trees are a mix of mature, semi-mature and immature trees, with natural regeneration occurring and occasional mature beech and oak. Species typically recorded included field maple, hawthorn *Crataegus monogyna* and elder over a ground flora of dog's mercury *Mercurialis perennis*, bluebell, lesser celandine *Ranunculus ficaria*, wood avens, ground ivy *Glechoma hederacea* and red campion *Silene dioica*.

10.8.21 Pitt and Players plantations situated on the south-eastern edge of the Site are largely coniferous and dominated by larch, with Scot's pine *Pinus sylvestris* and spruce *Picea spp.* present. Occasional ash, oak and elm were also noted. Ground flora is limited. Players Plantation (close to Shepherd's Hill and to the south of Pitt Plantation), comprises a mix of coniferous and broad-leaved species with ash, Scot's pine, oak, sweet chestnut and beech. The canopy is relatively open and there is an understorey of elm, elder and apple *Malus sp*.. Ground flora includes common nettle *Urtica dioica*, cow parsley *Anthriscus sylvestris*, Yorkshire fog *Holcus lanatus*, cleavers *Galium aparine* and bramble *Rubus fruticosus agg*.

Wet Woodland

10.8.22 Two areas of wet woodland are present within the Hermitage and Garendon Park, which appear to be seasonally inundated. Canopy species are dominated by alder and crack willow with sycamore, ash and occasional spruce and stands of hybrid black poplar. Small areas of open water were present within the western woodland with several centimetres of water noted at the time of surveying; ground conditions elsewhere in both areas were damp. Flora includes a mix of woodland flora found elsewhere on Site, with additional species such as wild angelica *Angelica sylvestris,* lesser water-parsnip *Berula erecta* and wavy bittercress *Cardamine flexuosa.* Of particular note are extensive areas of common reed *Phragmites australis* and reedmace *Typha latifolia*, greater pond sedge *Carex riparia* and water figwort *Scrophularia aquatica* associated with the lake.

10.8.23 The area of woodland adjacent to Hermitage Lake is within the Hermitage Estate LWS. The other wet woodland area to the east also qualifies under the LWS selection criteria because it is "*dominated by willow and/ or alder with the water table seasonally near or above the surface*" and exceeds 0.25ha.

<u>Grassland</u>

10.8.24 Grassland within the Site comprises neutral semi-improved grassland areas, including horse and cattle grazed pasture, meadows and field margins.

Semi-Improved Neutral Grassland

10.8.25 Semi-improved grassland of relatively high floristic diversity is present within three field compartments along the southern bank of the Black Brook, one field compartment within the Hermitage Estate, to the south of the disused railway line along the southern boundary of the Site and in small pockets within Garendon Park.

10.8.26 Typically within these areas grasses include abundant false oat-grass *Arrhenatherum elatius* with frequent cock's-foot *Dactylis glomerata*, red fescue *Festuca rubra* and Yorkshire fog. Occasional timothy *Phleum pratense*, creeping bent *Agrostis stolonifera*, crested dog's-tail *Cynosurus cristatus* and perennial rye-grass *Lolium perenne* was also observed. Herb species included frequent common sorrel *Rumex acetosa*, with pignut *Conopodium majus* and lesser celandine. Other species recorded included greater burnet *Sanguisorba officinalis*, yarrow *Achillea millefolium*, meadow buttercup *Ranunculus acris*, dandelion *Taraxacum officinale agg.*, common mouse-ear *Cerastium fontanum*, hogweed *Heracleum sphondylium* and broad-leaved dock *Rumex obtusifolius*. tufted hair-grass *Deschampsia caespitosa* was also occasionally present.

10.8.27 The Hermitage Estate Meadow (part of the Hermitage Estate LWS) contains additional species such as meadow vetchling *Lathyrus pratensis*, lady's bedstraw *Galium verum*, common birds'-foot trefoil *Lotus corniculatus* and harebell *Campanula rotundifolia*.

10.8.28 Further details of these grassland areas are provided in Appendix 10.3.

Species-Poor Semi-Improved Grassland

10.8.29 The remaining areas of grassland were relatively species poor. These included horse and cattle grazed pastures and road and track verges. These sections were often frequently disturbed and supported a less diverse variety of species including perennial rye-grass, Yorkshire fog, common bent *Agrostis capillaris*, ribwort plantain *Plantago lanceolata*, creeping buttercup *Ranunculus repens*, shepherd's purse *Capsella bursa-pastoris* and dove's-foot cranesbill *Geranium molle*. A species-poor grassland compartment was also located to the north of Home Covert in the west of the Site. Diversity was typically restricted and dominated by perennial rye-grass, common couch *Elytrigia repens* and creeping bent. Herb diversity was restricted and included occasional common mouse-ear, dove's-foot cranesbill and creeping thistle *Cirsium arvense*.

Marshy / Wet Grassland

10.8.30 A small area of damp grassland was observed to the south of Hermitage Lake, likely to be subject to occasional inundation. This area appears to be recovering from recent disturbance, containing frequent bare ground and occasional ruderal cover. Species include floating sweet-grass *Glyceria fluitans*, timothy, hairy sedge *Carex hirta*, creeping buttercup, soft rush *Juncus effusus*, perennial rye-grass and meadowsweet *Filipendula ulmaria* with occasional great willowherb *Epilobium hirsutum* and common nettle.

10.8.31 Occasional small areas of marshy grassland are also present in association with the Black Brook and Shortcliff Brook, additional species within these areas included tufted hair-grass, meadowsweet and compact rush *Juncus conglomeratus*.

Tall herb and ruderal vegetation

10.8.32 Tall herb and ruderal vegetation is frequent throughout the Site and is largely associated with the watercourses, wet ditches, hedgerow bases and woodland edges. Species most frequently recorded include common nettle, hogweed, rosebay willowherb *Chamerion angustifolium*, common ragwort *Senecio jacobea*, garlic mustard *Alliaria petiolata*, cow parsley, broad-leaved dock and spear thistle *Cirsium vulgare*. Grasses include timothy, red fescue, creeping bent, common couch and cock's-foot. Bramble growth is also common throughout.

Open standing water

10.8.33 The Hermitage Lake is a large man-made water-body, located to the east of The Hermitage in the centre of the Site with shallow banks and a deep silt/ organic layer around the edges. Reed-beds dominated by reedmace and common reed surround the water-body, with little other emergent or marginal vegetation. A duckweed *Lemna sp.* was present on the water surface. Trees, including poplars and silver birch, surround the pond and partially over-shade the margins.

Open running water

Black Brook

10.8.34 Black Brook flows through the centre of the Site from west to east and is designated as a Local Wildlife Site across the length of the Site. The river has a moderate flow and the water appears to be of good quality with frequent invertebrates observed including dragonflies and mayflies. The substrate is a mix of sand and gravel or pebble. The river banks are variable in nature, being steep sided in places and relatively shallow in others. Channel width also varies significantly from 2m to over 10m. The narrower sections typically support lush marginal vegetation including species such as great willowherb, watercress *Rorippa nasturtium-aquaticum* and reed canary-grass *Phalaris arundinacea* with dense patches of the invasive non-native Himalayan balsam *Impatiens glandiflora* (WCA sch.9). Scattered trees associated with this watercourse include ash, willow, alder and goat willow *Salix caprea* some of which are mature and coppiced. The wider sections of the brook are generally more shaded by elm, ash and alder and marginal vegetation including more grasses and herbaceous vegetation with wild angelica, hogweed and garlic mustard.

Shortcliff Brook

10.8.35 This brook runs from west to east within the Garendon Park area of the Site, bisecting the southernmost arable field. The brook has steep sided banks and is approximately 0.5m wide at its base and 1m at the bank-top. The substrate is silty with small cobbles. Shortcliff Brook is generally over-shaded by bank-side vegetation and trees and there is little emergent vegetation present. Bank-side vegetation included great willowherb, common couch, hedge bindweed *Calystegia sepium*, hogweed, rosebay willowherb, wild angelica and bittersweet *Solanum dulcamara*.

Stream south of Oxley Gutter

10.8.36 A small stream issues from a number of points within the wet woodland to the East of the Hermitage and runs eastwards out of the Site, feeding into the Black Brook downstream. This stream is heavily shaded for much of its length with little or no in-channel vegetation, except in

the shallow upper reaches where fool's watercress *Apium nodiflorum* is abundant, with occasional sedges *Carex spp.* and creeping bent spreading from the margins.

Ditches

10.8.37 Numerous wet ditches, including Oxley Gutter, are present within the Site boundary largely in association with the hedgerows, roads/ tracks and field drains. Many of the ditches had flowing shallow water at the time of survey and are typically vegetated by ruderals, tall herbs and coarse grasses. Bank sides are generally steep and overshaded by trees or hedgerows. Species most frequently recorded include great willowherb, common nettle, wood avens, red campion and false oat-grass. In-channel vegetation is restricted to occasional locally dominant patches of brooklime *Veronica beccabunga*, common reed and water mint *Mentha aquatica*.

Arable Farmland

10.8.38 Land under active arable cultivation is widely present across the Site, comprising a number of smaller compartments enclosed by hedgerows to the north of Black Brook with much larger field compartments to the south and within Garendon Park. A range of cereal and vegetable crops were recorded including wheat, barley, flax and bean. Cover crops for game (predominantly maize) were frequently observed at the field margins within the central and southern sections of the Site.

10.8.39 Field margins are similar in composition across the Site and vary in width from 1 - 4m. Species diversity is generally limited. Species present include false oat-grass, perennial rye-grass, Yorkshire fog, cock's-foot, creeping bent and black grass *Alopecurus myosuroides*. Herb species are typical for cultivated soils and include frequent arable weeds such as knotgrass *Polygonum aviculare*, black bindweed *Fallopia convolvulus*, scentless mayweed *Tripleurospermum inodorum* and good-King-Henry *Chenopodium bonus-henricus*. ribwort plantain, dove's-foot cranesbill. bistort *Polygonum bistorta* and common poppy *Papaver rhoeas* were also commonly recorded.

Hedgerows

10.8.40 A total of 121 sections of hedgerow were recorded across the Site, providing a total length of approximately 19.26km. Of these, 78 hedgerows (12.72m) qualify as being of nature conservation priority (grade 1 or 2) under the HEGS assessment and 11 (1.33km) of these qualify as Important under the Hedgerow Regulations. Three hedgerows potentially qualify under the LWS selection criteria. Details of the hedgerow assessments are provided in Appendix 10.2.

10.8.41 A large proportion of the hedgerows are situated to the north of the Black Brook where arable field compartments are smaller in size. Here the hedgerows are intensively managed and typically 2m in height and 2m in width. Hawthorn, blackthorn *Prunus spinosa* and elder are the dominant species recorded with frequent dog rose *Rosa canina* and bramble. Hedgerows to the south of the Black Brook are generally larger and typically 3m in height and 2.5m wide and less densely distributed due to the larger field compartments.

10.8.42 Native hedgerows are classed as habitats of principal importance under the NERC Act 2006 and as a priority habitat in England and are listed as a habitat of national importance on the LLRBAP.

10.8.43 Overall the network of hedgerows throughout the Site provide habitat that is of district nature conservation value.

Invasive Non-Native Plants

10.8.44 A well-established stand of Japanese knotweed *Fallopia japonica*, approximately 35m x 10m, is located within the woodland at the Hermitage, as indicated on Figure 10.2.

10.8.45 Occasional rhododendron *Rhododendron ponticum* is also present within Home Covert

10.8.46 Dense patches of Himalayan balsam are present at intervals along Black Brook.

10.8.47 These species are all listed as invasive non-native species on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Fauna

Badgers

10.8.48 Full details of the badger surveys carried out are presented in Appendix 10.4 (this appendix is to remain confidential to protect badgers from unlawful interference and is therefore bound separately).

10.8.49 There were twenty two badger records returned from consultations as shown on Figure 10.4 (confidential). Seven of these records were within the Site boundary.

10.8.50 Badger surveys in 2013 identified a total of at least 37 badger setts (including active and inactive). A total of six main setts were identified, with five annex, six subsidiary and 20 outlying setts. The locations of these setts are shown on Figure 10.5 (confidential).

10.8.51 Badger activity was recorded across the Site, with more of a concentration to the north of the Black Brook where three of the six main setts occur in the eastern half of the northern area. This is most likely to be due to the local topography and pattern of small field compartments.

10.8.52 The remaining three main setts are located close to the eastern and southern boundaries of the Site.

10.8.53 No main sett was recorded within the western section of the Site, however activity was consistent with the rest of the Site. It is therefore considered likely that an off-Site main sett is located to the west of the Site, entering the Site via underpasses under the M1. A second off-Site sett may be located to the north-west of the Site.

10.8.54 It is believed that the badger population in this area is representative of the local area with similar habitats present off-Site to the north east, north-west, west and south.

10.8.55 The Site is therefore of local nature conservation value for badgers.

Bats

10.8.56 Full details of the bat surveys carried out are presented in Appendix 10.5.

10.8.57 There were 24 bat roost records returned from consultations including seven pipistrelle *Pipistrellus sp.*, two brown long-eared *Plecotus auritus* and a noctule *Nyctalus noctula*. The nearest roost was approximately 150m to the south east of the Site boundary.

10.8.58 Buildings within the Site provide potential roost sites for bats, including: White Lodge; the Garendon Park monuments; the Hermitage; the Red Arch and farm buildings near to Hermitage Lake; and Bedlam Barn Farm.

10.8.59 A total of 78 trees were observed which provided opportunities to support roosting bats; 17 trees were considered to provide low potential; 44 moderate potential; and 17 high potential to support roosting bats. A large noctule maternity roost was recorded within an oak tree in the northern section of Home Covert.

10.8.60 The species assemblage recorded is considered to be unexceptional for a Site of this size supporting a variety of habitats and given its geographic location.

10.8.61 The species recorded over the course of the surveys are summarised in Table 10.8.

Table 10.8 Summary of bats recorded during surveys

Common Name	Scientific Name	Status within the Site
Common pipistrelle	*Pipistrellus pipistrellus*	Recorded frequently and widespread within the Site. Roost will very likely be present within the on-Site buildings and possibly also occasionally within trees.
Soprano pipistrelle*	*Pipistrellus pygmaeus*	Recorded frequently and widespread within the Site. Roost will very likely be present within the on-Site buildings and possibly also occasionally within trees.
Noctule*	*Nyctalus noctula*	Maternity roost recorded in a tree within Home Covert and other tree roosts also possible given their transient nature. Noctule were recorded in flight sporadically throughout the Site.
Brown long-eared*	*Plecotus auritus*	Recorded occasionally in association with the areas of woodland. Roost Sites are likely to be present within the on-Site buildings and possibly also occasionally within trees.
Daubenton's	*Myotis daubentonii*	Small numbers recorded foraging over the lake. Roosts possible within on-Site buildings / trees.
Nathusius' pipistrelle	*Pipistrellus nathusii*	Small number of recordings along the Black Brook in August, September and October 2013. Roosts unlikely within the Site but some potential present within buildings and trees.
Myotis species.	*Myotis sp.*	Recorded sporadically throughout the Site. Roosts possible within on-Site buildings / trees.

*Species of Principal Importance (S41 NERC).

10.8.62 Common pipistrelle and soprano pipistrelle were the most frequently recorded species. Whilst Nathusius' pipistrelle is a rare bat species it is widespread within the region and relatively low numbers were recorded on Site.

10.8.63 The key habitats within the Site for bats are the mosaic of habitats within the centre of the Site including several areas of woodland such as The Hermitage; parkland; the large lake; farm buildings and houses. The avenue of trees connecting these habitats to Home Covert and smaller parcels of woodland were also considered to be of increased value for bats. It is considered that these areas are of District/ County significance.

10.8.64 Unexceptional levels of bat activity were recorded within the north and west areas of the Site although the Black Brook provides strong connectivity across the Site and habitats of increased foraging value. It is considered that these habitats are likely to be of Local/ District value for bats.

10.8.65 A noctule maternity roost of approximately 65 animals was recorded within a tree in Home Covert. This is a notable feature within the Site and is likely to be of County significance. Other roost sites are also likely to be present within the numerous other buildings within the Site.

Birds

10.8.66 Full details of the breeding bird surveys carried out are presented in Appendix 10.6.

10.8.67 The Site supports a relatively diverse range of farmland and woodland birds. A total of 59 species were recorded during the winter bird surveys, 28 of which are either protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); are listed as NERC priority species; or feature on the BoCC Red- and Amber-lists. Notable species recorded during breeding bird surveys within the Site are summarised in Table 10.9.

Table 10.9 Summary of notable bird species recorded during breeding bird surveys.

Species	UK Conservation Status	Breeding status on Site	Recent Status within Leicestershire and Rutland†
Mallard *Anas platyrhynchos*	Amber list	Confirmed	Fairly common breeder
Kestrel *Falco tinnunculus*	Amber list	Non-breeder	Fairly common breeder
Lapwing *Vanellus vanellus*	BoCC Red list NERC (S41)	Probable	Fairly common breeder
Lesser black-backed gull *Larus fuscus*	Amber list	Non-breeder	Common during passage, uncommon in summer and limited breeding evidence
Stock dove *Columba oenas*	Amber list	Non-breeder	Fairly common to common breeder
Swift *Apus apus*	Amber list	Non-breeder	Common migrant breeder
Kingfisher *Alcedo atthis*	Schedule 1 (WCA) BoCC Amber list	Confirmed	Uncommon breeder

Species	UK Conservation Status	Breeding status on Site	Recent Status within Leicestershire and Rutland†
Green woodpecker *Picus viridus*	Amber list	Possible	Fairly common breeder
Skylark *Alauda arvensis*	BoCC Red list NERC (S41)	Probable	Common resident breeder, autumn migrant and winter visitor
Swallow *Hirundo rustica*	Amber list	Possible	Common migrant breeder
House martin *Delichon urbica*	Amber list	Non-breeder	Common migrant breeder
Meadow pipit *Anthus pratensis*	Amber list	Non-breeder	Common passage migrant, uncommon breeder
Dunnock *Prunella modularis*	BoCC Amber list NERC (S41)	Probable	Abundant breeder
Wheatear *Oenanthe oenanthe*	Amber list	Non-breeder	Uncommon to fairly common passage migrant, has bred
Fieldfare *Turdus pilaris*	Schedule 1 (WCA) BoCC Red list	Non-breeder	Rare in summer
Song thrush *Turdus philomelos*	BoCC Red list NERC (S41)	Probable	Common breeder
Mistle thrush *Turdus viscivorus*	Amber list	Confirmed	Common breeder
Whitethroat *Sylvia communis*	Amber list	Confirmed	Common migrant breeder
Willow warbler *Phylloscopus trochilus*	Amber list	Probable	Abundant migrant breeder
Marsh tit *Poecile palustris*	BoCC Red list NERC (S41)	Possible	Fairly common breeder
Starling *Sturnus vulgaris*	BoCC Red list NERC (S41)	Probable	Abundant breeder
House sparrow *Passer domesticus*	BoCC Red list NERC (S41)	Probable	Common resident breeder
Tree sparrow *Passer montanus*	BoCC Red list NERC (S41)	Possible	Fairly common breeder
Linnet *Carduelis cannabina*	BoCC Red list NERC (S41)	Possible	Common breeder
Bullfinch *Pyrrhula pyrrhula*	BoCC Amber list NERC (S41)	Probable	Common breeder

Species	UK Conservation Status	Breeding status on Site	Recent Status within Leicestershire and Rutland†
Yellowhammer *Emberiza citronella*	BoCC Red list NERC (S41)	Confirmed	Common breeder
Reed Bunting *Emberiza schoeniclus*	BoCC Amber list NERC (S41)	Possible	Common breeder

† Taken from the Leicestershire and Rutland Bird Report 2010.

10.8.68 The highest densities of breeding birds were observed in areas of woodland and along the Black Brook. Hedgerows throughout the Site were also used by a variety of species, with small numbers of birds in arable field areas. The arable fields in the northern part of the Site support a relatively low diversity of species, but these include fairly high numbers of notable farmland birds including yellowhammer, skylark and linnet. Overall Site provides habitat resources of local nature conservation value for breeding birds.

10.8.69 A total of 51 species were recorded during the winter bird surveys, 21 of which are either protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); are listed as NERC priority species; or feature on the BoCC Red- and Amber-lists. These notable species are summarised in Table 10.10. Full details of the wintering bird surveys carried out are presented in Appendix 10.7.

Table 10.10 Summary of notable bird species recorded during wintering bird surveys

Species	Latin Name	Maximum No. Recorded	Conservation Status
Mallard	*Anas platyrhynchos*	77	Amber list
Grey partridge	*Perdix perdix*	4	Red list, NERC
Kestrel	*Falco tinnunculus*	5	Amber list
Black-headed gull	*Chroicocephalus ridibundus*	51	Amber list
Stock dove	*Columba oenas*	4	Amber list
Kingfisher	*Alcedo atthis*	1	Schedule 1, Amber
Green woodpecker	*Picus viridis*	1	Amber list
Skylark	*Alauda arvensis*	41	Red list, NERC
Meadow pipit	*Anthus pratensis*	1	Amber list
Dunnock	*Prunella modularis*	18	Amber list, NERC
Fieldfare	*Turdus pilaris*	82	Schedule 1, Red list
Song thrush	*Turdus philomelos*	4	Red list, NERC
Redwing	*Turdus iliacus*	85	Schedule 1, Red list
Mistle thrush	*Turdus viscivorus*	6	Amber list
Marsh tit	*Poecile palustris*	1	Red list, NERC
Starling	*Sturnus vulgaris*	113	Red list, NERC
House sparrow	*Passer domesticus*	5	Red list, NERC
Linnet	*Carduelis cannabina*	62	Red list, NERC

Bullfinch	*Pyrrhula pyrrhula*	10	Amber list, NERC
Yellowhammer	*Emberiza citronella*	8	Red list, NERC
Reed bunting	*Emberiza schoeniclus*	2	Amber list, NERC

10.8.70 All but two of the recorded species are common and widespread in Leicestershire and the UK[6] in winter. The exceptions are kingfisher (uncommon resident) and raven (scarce resident). A single kingfisher was observed on Black Brook during December and two ravens were recorded briefly in an arable field in November before flying north.

10.8.71 Several small flocks of Schedule 1 fieldfare and redwing were present during all surveys. Both are winter thrushes that overwinter in the UK in the hundreds of thousands.

10.8.72 The populations on Site are unremarkable and the winter bird assemblage on-Site is of no more than a local value of conservation importance.

Great crested newts

10.8.73 Full details of the great crested newt surveys carried out are presented in Appendix 10.8.

10.8.74 The only great crested newt record returned from consultations was from a location in Hathern approximately 600m from the nearest Site boundary as shown on Figure 10.1. The nearest on-Site pond is over 1.5km from this record location and separated by significant barriers to dispersal.

10.8.75 The Site includes suitable terrestrial habitats for great crested newts including rough grassland, field margins, woodland, scrub and ruderal vegetation.

10.8.76 Five waterbodies were identified within 500m of the Site with potential to be suitable for great crested newts. These are shown on Figure 10.18. The suitability of these waterbodies for great crested newts was assessed using the HSI assessment, summarised in Table 10.11.

[6] The Leicestershire & Rutland Annual Bird Report 2010 (LROS)

Table 10.11 Habitat Suitability Assessment of waterbodies for great crested newts

Pond reference & location	Description	Approximate distance from Site at nearest point	HSI score	Suitability	Predicted probability of presence
Pond 1 (P1) SK 50495 20514	Well managed pond, with gentle sloping sides, surrounded with lush grassland and woodland. Part of public green space within housing estate. Breeding waterfowl including coots and mallard. Leeches, water snails and water stick insect (*Ranatra linearis*) contribute to the invertebrate assemblage. Many small fish - stickleback, tench. Aquatic plants noted were ivy-leaved duckweed & iris	95 metres from eastern Site boundary.	0.36	Poor	3%
Pond 2 (P2) SK 50568 20488	Smaller, slightly more exposed version of P1, also located <20m from P1. Very similar in content to P1 in terms of associated flora and fauna. Nesting mute swan, in place of previously mentioned waterfowl utilising P1,	170m from eastern boundary	0.52	Below average	20%
Pond 3 (P3) SK 50025 19997	A large, deep man-made water-body with shallow banks and silty/organic layer around the edges. Reed-beds surround the water-body, with little other emergent or marginal vegetation. A duckweed Lemna sp. was present on the water surface. Trees, including poplars and silver birch, surrounded the pond and partially over-shaded the margins. Lots of large carp in lake. Lots of avian activity, with greylag geese, mallard and moorhen. extension of the lake during seasonal flooding of adjacent woodland	Within the Site boundary	0.3	Poor	3%

Pond reference & location	Description	Approximate distance from Site at nearest point	HSI score	Suitability	Predicted probability of presence
Pond 4 (P4) SK 50869 20404	Very shaded, stagnant pond with very little aquatic vegetation. Mallard with fledglings.	465 metres from the eastern Site boundary	0.43	Poor	3%
Pond 5 (P3) SK 49977 20050	A small, unshaded fish stocked pond, cut off from the large fishing lake (P3)	Within the Site boundary	0.43	Poor	3%

10.8.77 Surveys of these ponds found no evidence of great crested newts. It is therefore reasonably unlikely that any great crested newts would be present within the Site.

Otters

10.8.78 Full details of the otter surveys carried out are presented in Appendix 10.9.

10.8.79 The only otter record returned from the consultations was approximately 1.85km north of the Site boundary along the River Soar.

10.8.80 The Black Brook supports a number of fish and invertebrate species that are known to be prey species for Otter and as such has good potential to support an otter population. A number of recent signs were found along the brook indicating otter activity including spraints, footprints and slides as well as lie sites and a possible holt site. This would suggest that the Black Brook has regular otter activity along its length, but no evidence was found to suggest a breeding population might be present.

10.8.81 Hermitage Lake supports populations of coarse fish species including carp *Cyprinu carpio* which under these circumstances are an easy prey species for otter. The lake also extends into an area of wet woodland which is submerged year round, which provides suitable undisturbed habitat for holts and refuges.

10.8.82 A number of otter signs were found including spraints around the lakes edge and a likely holt site within the wet woodland area. The potential holt site is located within a fallen tree stump in the wet woodland. The stump has become enclosed and the area within hollowed out at some point. The cavity within has both below and above water level entrances and a number of spraints were found on and around the stump. No bedding material was present, indicating that it is not used currently as a breeding site, but this feature has high potential to be used as an otter holt.

10.8.83 The Shortcliff Brook is smaller in size than the Black brook with a smaller bed size and lower total flow of water. It runs through two areas of woodland on Site and has potential to be used by otters for moving through the Site although it does not support a large fish population and is unlikely to be significant as a foraging resource. No evidence of otters was found on the Shortcliff Brook or along other ditches within the Site, however, it is likely that these features are used by otters to move between habitat areas where there is suitable connectivity.

10.8.84 Overall, due to the presence of a regularly occurring population of otters using the Site as part of their territory and likely to have holts present. As such, the Site is of district – county nature conservation value for otter.

Water voles

10.8.85 Full details of the water vole surveys carried out are presented in Appendix 10.9.

10.8.86 The only record of water vole was 500m south from the Site, near to Holywell Hall from 1995.

10.8.87 Although the riparian habitats along the Black Brook, Shortcliff Brook, the stream south of Oxley Gutter and around the Hermitage Lake are suitable for water voles, no evidence of this species was recorded during surveys.

10.8.88 It is therefore reasonably unlikely that water voles would be present within the Site or could be affected by the Development.

White-clawed crayfish

10.8.89 Full details of the crayfish surveys carried out are presented in Appendix 10.9.

10.8.90 The nearest records of white-clawed crayfish were from 1995, on the Black Brook just within the north-western boundary of the Site near the Hathern Road bridge.

10.8.91 Although the aquatic habitats within the Site are suitable for white-clawed crayfish no evidence of this species was recorded during surveys.

10.8.92 It is therefore reasonably unlikely that white-clawed crayfish would be present within the Site or could be affected by the Development.

Reptiles

10.8.93 Full details of the reptile surveys carried out are presented in Appendix 10.10.

10.8.94 No records of any reptile species in the area were returned from consultation requested.

10.8.95 The Site includes habitats that are suitable habitat for use by reptiles including grass snake *Natrix natrix* common lizard *Zootoca vivipara* and slow worm *Anguis fragilis*. These habitats include grassland, field margins, hedgerows, ruderal vegetation, wood edges and marginal vegetation around waterbodies.

10.8.96 During surveys, a single grass snake was recorded adjacent to the Black Brook. The gamekeeper also reported having seen grass snake and common lizard within Garendon Park.

10.8.97 Although only a single grass snake was recorded during surveys, indicating the presence of a small population in the area of the Black Brook, it is reasonably likely that grass snakes are present in low numbers in suitable habitats across the Site. There is also potential for common lizard and/ or slow worm to be present in low numbers.

10.8.98 Overall, the surveys indicate that reptiles are only present in small numbers and as such, the areas of suitable habitat within the Site are of nature conservation value for reptiles within the context of the Site.

Other Priority Species

10.8.99 Additional Species of Principal Importance (S41 NERC) recorded or likely to be present in the vicinity of the Site and potentially occurring within the Site due to suitable habitats being present are summarised in Table 10.12.

Table 10.12 Summary of Priority Species Potentially Occurring within the Site

Species	Conservation Status	Details
Common toad *Bufo Bufo*	Species of Principal Importance (S41 NERC)	Could be present in suitable waterbodies and dense terrestrial vegetation
Hedgehog *Erinaceus europaeus*	Species of Principal Importance (S41 NERC)	Likely to be present across the Site.
Brown hare *Lepus europaeus*	Species of Principal Importance (S41 NERC)	Could be present in arable farmland areas.
Brown Trout *Salmo trutta*	Species of Principal Importance (S41 NERC)	Recorded in the Black Brook and probably present within the Site.
Grey Dagger *Acronicta psi*	Species of Principal Importance (S41 NERC)	Could be present in association with woodland habitats.
Brown-spot Pinion *Agrochola litura*	Species of Principal Importance (S41 NERC)	Could be present in association with woodland habitats.
Small square-spot *Diarsia rubi*	Species of Principal Importance (S41 NERC)	Could be present in association with wet woodland habitats.
Small Phoenix *Ecliptopera silaceata*	Species of Principal Importance (S41 NERC)	Could be present in association with woodland habitats.
September Thorn *Ennomos erosaria*	Species of Principal Importance (S41 NERC)	Could be present in association with woodland habitats.
Dusky Thorn *Ennomos fuscantaria*	Species of Principal Importance (S41 NERC)	Could be present in association with woodland habitats, particularly where ash trees are present.
Garden Dart *Euxoa nigricans*	Species of Principal Importance (S41 NERC)	Could be present in association with historic garden area of Garendon Park.
Double Dart *Graphiphora augur*	Species of Principal Importance (S41 NERC)	Could be present in association with woodland and scrub habitats.
Ghost Moth *Hepialus humuli*	Species of Principal Importance (S41 NERC)	Could be present in association with grassland and parkland habitats.
White-letter Hairstreak *Satyrium w-album*	Species of Principal Importance (S41 NERC)	Could be present in association with woodland habitats, particularly where elm is present.
Brindled Beauty *Lycia hirtaria*	Species of Principal Importance (S41 NERC)	Could be present in association with woodland habitats.

10.9 Potential Effects

10.9.1 This section considers the potential impact from construction and operation of the Development. The assessment of potential impacts has been made with reference to the description of development and the illustrative Masterplan.

Construction Effects

Effects on Designated Sites for Nature Conservation

10.9.2 The potential effects of construction of the Development on designated sites for nature conservation are presented in 10.13.

Table 10.13 Potential construction effects on designated sites for nature conservation

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect (Probability)
Statutory Designated Sites				
Oakley Wood SSSI	National	Air quality impacts (dust)[7]	Negligible	Negligible
Newhurst Quarry SSSI	National	Air quality impacts (dust)	Negligible	Negligible
Ives Head SSSI	National	None	N/a	N/a
Beacon Hill, Hangingstone & Outwoods SSSI	National	None	N/a	N/a
Blackbrook Reservoir	National	None	N/a	N/a
Cotes Grassland	National	None	N/a	N/a
Charnwood Lodge	National	None	N/a	N/a
Loughborough Meadows	National	None	N/a	N/a
One Barrow Plantation	National	None	N/a	N/a
Ulverscroft Valley	National	None	N/a	N/a
Shepshed Cutting	Negligible	None	N/a	N/a
Holly Rock Fields	National	None	N/a	N/a
Grace Dieu And High Sharpley	National	None	N/a	N/a
Non-Statutory Designated Sites				

[7] See Chapter 11: Air Quality for detailed assessment

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect (Probability)
Black Brook LWS	County	Habitat loss	1 road crossing (10m wide), 1 footpath/ access crossing (4m wide): loss of up to 140m^2 bankside habitats and in-river habitat	Site level (near-certain)
		Severance/ loss of continuity of habitats	1 road crossing (10m wide), 1 footpath/ access crossing (4m wide)	Site level(near-certain)
		Disturbance/ damage during construction	Extent of LWS within the Site (up to 1.22ha) could be adversely affected to some degree (short to medium term)	Local (unlikely)
		Pollution during construction	Could affect Black Brook and River Soar downstream of Site	County (unlikely)
		Introduction of invasive species	Low risk of significant effect	Local (unlikely)
Hermitage Estate LWS	District	Loss of habitat	2.2ha neutral grassland	Local-District (near certain)
		Disturbance, damage & pollution during construction	The extent of the retained habitats within the LWS (up to 8.31ha) could be adversely affected to some degree (short to medium term)	Local (unlikely)
		Isolation from associated habitats	The LWS could become isolated from associated habitats	Local (unlikely)
Stonebow Washlands LWS	District	Disturbance, damage & pollution during construction	Habitats up to 20m from the Site boundary (0.4ha) could be adversely affected to some degree (short to medium term)	Local (unlikely)
		Isolation from associated habitats	The LWS could become entirely isolated from associated habitats	Local (unlikely)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect (Probability)
Booth Wood LWS	District-County	Disturbance, damage & pollution during construction	Habitats up to 20m from the Site boundary (0.4ha) could be adversely affected to some degree (short to medium term)	Local (unlikely)
		Isolation from associated habitats	The LWS could become entirely isolated from associated habitats	Local (unlikely)
Hathern Road Verge (east side) Candidate LWS	District	Damage & pollution during construction	The extent of the LWS (0.21ha) could be adversely affected to some degree (short to medium term)	Local (unlikely)
		Isolation from associated habitats	The LWS could become isolated from associated habitats	Local (unlikely)
Hathern Drive Parish Level Site	Local	Loss	Approximately 0.06ha will be lost to the creation of the main access road.	Local (near-certain)
		Disturbance, damage & pollution during construction	The extent of the Hathern Drive Site within and immediately adjacent to the Site (2.96ha) could be adversely affected to some degree (short to medium term).	Local (probable)
		Severance and isolation from associated habitats	The Hathern Drive Site could become isolated from associated habitats. Hathern Drive will be intersected by the proposed access road (c. 20m separation)	Local (unlikely)
Baileys Plantation Parish Level Site	Local	Disturbance, damage & pollution during construction	The extent of Bailey's Plantation (6.35ha) could be adversely affected to some degree (short to medium term).	Local (unlikely)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect (Probability)
		Isolation from associated habitats	Bailey's Plantation could become isolated from associated habitats.	Local (unlikely)
Pear Tree Lane Parish Level Site	Local	Disturbance, damage & pollution during construction	The extent of Pear Tree Lane (1.43ha) could be adversely affected to some degree (short to medium term).	Local (unlikely)
		Isolation from associated habitats	Bailey's Plantation could become entirely isolated from associated habitats.	Local (unlikely)
Woodland near the Obelisk Parish Level Site	Local	Disturbance, damage & pollution during construction	The extent of the woodland (1.38ha) could be adversely affected to some degree (short to medium term).	Local (unlikely)
		Isolation from associated habitats	The woodland could become entirely isolated from associated habitats.	Local (unlikely)
Home Covert District Level Site	District	Loss	Approximately 1ha of woodland will be lost to allow for the Strategic Link Road	Local (near-certain)
		Disturbance, damage & pollution during construction	Up to the full extent of Home Covert (10.38ha) could be adversely affected to some degree (short to medium term).	Local (probable)
		Severance and isolation from associated habitats	The woodland could become isolated from associated habitats.	Local (unlikely)
			The Strategic Link Road will separate the western 60m of Home Covert.	Local (near-certain)
Dismantled Railway Line Parish Level Site	Local	Loss	Approximately 0.3ha of woodland will be lost to allow for the Strategic Link Road	Local (near-certain)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect (Probability)
		Disturbance, damage & pollution during construction	The extent of the Disused Railway Line Site (1.94ha) could be adversely affected to some degree (short to medium term).	Local (unlikely)
		Severance and isolation from associated habitats	The railway line could become isolated from associated habitats.	Local (unlikely)
			The Strategic Link Road will separate the railway line into two parts (c. 25m separation).	Local (near-certain)

Effects on Habitats and Flora

10.9.3 The potential effects of construction of the Development on habitats within the Site are presented in Table 10.14.

Table 10.14 Potential construction effects on habitats within the Site

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Priority/ important hedgerows	District	Loss	2278m	Local (near certain)
		Severance and isolation from associated habitats	The primary infrastructure will result in severance of 8 priority hedgerows	Local (near certain)
		Disturbance/ damage during construction	The extent of the habitat (12.72km) could be adversely affected to some degree (short to medium term).	Local (unlikely)
Species poor hedgerows	Local	Loss	1516m	Site (near certain)
		Severance and isolation from associated habitats	The primary infrastructure will result in severance of 5 low priority hedgerows	Site (near certain)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
		Disturbance/ damage during construction	The extent of the habitat (6.55km) could be adversely affected to some degree (short to medium term).	Site (unlikely)
Veteran, mature and notable trees	District	Loss	9 individual trees and 5 groups of trees (in part)	Local (near certain)
		Isolation from associated habitats	All trees within the development area could be affected	Local (probable)
		Disturbance/ damage during construction	Could affect entire resource	Local (unlikely)
Other trees	Local	Loss	7 individual trees and 5 groups of trees (in part)	Site (near certain)
		Isolation from associated habitats	All trees within the development area could be affected	Site (probable)
		Disturbance/ damage during construction	Could affect entire resource	Site (unlikely)
Overall woodland resource	District	Loss	0.97ha	Site (near certain
		Disturbance/ damage during construction	The extent of the habitat (70.54ha) could be adversely affected to some degree (short to medium term).	Local (unlikely)
		Isolation from associated habitats	The western portion of Home Covert will be separated from the rest of the wood by the Strategic Link Road. The disused railway line will be severed (c. 25m separation.	Local (probable)
Meadows adjacent to Black Brook (Semi-improved neutral grassland)	Local	Loss as a result of access road through southern edge	c. 0.18ha	Local (near certain
		Disturbance, damage & pollution during construction	The extent of the habitat (2.88ha) could be adversely affected to some degree (short to medium term).	Local (unlikely)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Hermitage Meadow (part of The Hermitage Estate LWS)	County	Loss	Extent of grassland (2.2ha)	County (near certain)
Poor semi-improved grassland	Site	Loss	c.7.2ha	Site (near certain)
Arable	Negligible	Loss	c. 250 ha for development (up to c. 95ha for potential enhancements including woodland and grassland.	Negligible (near certain)
Scrub	Negligible	Loss	Negligible	Negligible (near certain)
Ruderal vegetation	Site	Loss	Negligible	Negligible (near certain)
Black Brook	County	See 'Black Brook LWS' above		County
Shortcliff Brook	Local	Habitat loss	1 road crossing: loss of up to 100m^2 bankside habitats and in-river habitat	Site level (near certain)
		Severance/ loss of continuity of habitats	1 road crossing	Site level (near certain)
		Disturbance/ damage during construction	The extent of the brook (up to 0.2ha) could be adversely affected to some degree (short to medium term)	Local (unlikely)
		Pollution during construction	Could affect Shortcliff Brook and Burleigh Brook downstream	Local (unlikely)
		Introduction of invasive species	Low risk of significant effect	Local (unlikely)
Stream through wet woodland/ south of Oxley Gutter	Local	Habitat loss	1 footbridge crossing (3m wide): loss of up to 30m^2 bankside habitats and in-river habitat	Site level (probable)
		Severance/ loss of continuity of habitats	1 footbridge crossing)	Site level (near certain)
		Disturbance/ damage during construction	The extent of the stream (up to 0.12ha) could be adversely affected to some degree (short to medium term)	Local (unlikely)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
		Pollution during construction	Could affect stream and Black Brook downstream	Local (unlikely)
		Introduction of invasive species	Low risk of significant effect	Local (unlikely)
Ditches and drains	Site	Loss	No significant loss	Negligible (near certain)
Hermitage Estate Lake – part of Hermitage Estate LWS	District	Disturbance, pollution during construction	Could affect the extent of the lake (1.41ha) to some degree short term)	Local (unlikely)
		Introduction of invasive species	Low risk of significant effect	Local (unlikely)
Garendon Park (wider mosaic of habitats)	Local	Loss of habitats due to road construction	2ha arable farmland, 0.94ha woodland and 30m hedgerow	Site (near certain)
		Isolation and fragmentation of habitats	Land to the west of the proposed Strategic Link Road (c. 8.89ha) could be isolated from the remainder of the Park.	Site (near certain)
		Disturbance, pollution during construction	Habitats adjacent (within up to 50m) to the road construction corridor could be affected in the short term.	Site (unlikely)

Effects on Fauna

10.9.4 The potential effects of construction of the Development on fauna within and in the vicinity of the Site are presented in Table 10.15.

Table 10.15 Potential construction effects on fauna within the Site

Species/ Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Badgers	Local	Loss of setts	Loss of 1 Main sett and two associated annex setts, plus loss of up to 7 outlier setts	Local (near-certain)
		Disturbance of setts during construction	Possible disturbance to up to 3 main setts plus outliers	

Species/ Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
		Loss of foraging habitats	Four of the six clans present within the Site and the two off-Site clans could suffer significant loss of foraging habitats	
		Severance of habitats and territories; risk of increased mortality rates due to traffic.	One on-Site clan and two off-Site clans are likely to suffer from severance of habitats within their territories	
Foraging habitats for bats	Local-District	Loss of foraging habitats	Loss of poor quality farmland habitat and 3.8km hedgerow	Local (near certain)
		Disturbance of foraging habitats during construction	All habitats in the vicinity of construction works could be affects	Local (near certain)
Commuting routes for bats	Local-District	Loss/ severance of commuting routes	Loss of 3.8km hedgerow, separation of habitats to west and east of proposed Strategic Link Road, along Black Brook and Hathern Drive.	Local (probable)
		Disturbance of commuting routes during construction	All habitats in the vicinity of construction works could be affects	Local (probable)
Bat roost sites	Local-District	Loss of roost sites	Up to 28 trees with significant bat roost potential could be affected by construction of the Strategic Link Road	District (probable)
		Disturbance of roost sites during construction	Any tree or building roosts in the vicinity of works could be affected (short-term)	Local (probable)
Breeding birds	Local	Loss of nesting and summer foraging habitats	Loss of approximately 250ha of habitat for birds of open farmland and 2.5ha of habitat for birds of woodland and hedgerows	Local (near certain)

Species/ Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
		Reduction in value of habitats due to disturbance during construction	All habitats in the vicinity of construction works could be affects (short-term)	Local (probable)
		Disturbance of nesting birds during construction	Birds nesting in all habitats in the vicinity of construction works could be affects (short-term)	Local (probable)
Wintering birds	Local	Loss of suitable foraging habitats	Loss of approximately 250ha of habitat for birds of open farmland and 2.5ha of habitat for birds of woodland and hedgerows	Local (near certain)
		Disturbance of foraging habitats and roost sites during construction	All habitats in the vicinity of construction works could be affects (short-term)	Local (probable)
Otters	County	Loss of habitat	1 road crossing (10m wide), 2 footpath/ access crossings (4m wide): loss of up to c. 140m^2 bankside habitats and in-river habitat (no loss of resting places).	Site level (near certain)
		Severance/ loss of continuity of habitats	1 road crossing (10m wide), 2 footpath/ access crossings (4m wide) Residential development between Black Brook and the lake	Site Level (near certain)
		Damage/ disturbance of holts/ resting places and habitats, pollution of habitats during construction	Extent of habitat (c. 4.2ha) could be adversely affected to some degree (short to medium term).	Local (unlikely)

Species/ Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Reptiles	Local	Loss and severance of habitat	c. 0.2 of suitable habitats could be lost. Separation of habitats east and west of the proposed Strategic Link Road	Site (near certain)
		Disturbance during construction	Small population of grass snake and possible small populations of common lizard and slow worm could be disturbed	Site (unlikely)
Other notable species	Local	Loss and severance of habitat	Loss of c. 2.5ha of hedgerow and woodland habitats and loss of low value farmland	Local (probable)
		Disturbance during construction	Locally occurring populations may be disturbed	Local (probable)

Post Construction Effects

Effects on Designated Sites for Nature Conservation

10.9.5 The potential post-construction effects of the Development on designated sites for nature conservation are presented in Table 10.16.

Table 10.16 Potential post-construction effects on designated sites for nature conservation

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Statutory Designated Sites				
Oakley Wood SSSI	National	Increased visitor disturbance	Negligible (no public access)	Negligible (near certain)
Newhurst Quarry SSSI	National	Increased visitor disturbance	Negligible (no public access)	Negligible (near certain)
Ives Head SSSI	National	Increased visitor disturbance	Negligible (no public access)	Negligible (near certain)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Beacon Hill, Hangingstone & Outwoods SSSI	National	Increased visitor disturbance	Approximately 10% increase in local population within 5 km of the SSSI[8]	Local (probable)
Blackbrook Reservoir	National	Increased visitor disturbance	Negligible (limited public access, over 2 km from Site)	Negligible (near certain)
Cotes Grassland	National	Increased visitor disturbance	Negligible (over4 km from Site, very local attraction value)	Negligible (near certain)
Charnwood Lodge	National	Increased visitor disturbance	Negligible (restricted access only to Wildlife Trust members only)	Negligible
Loughborough Meadows	National	Increased visitor disturbance	Negligible (limited public access, over 2 km from Site)	Negligible (near certain)
One Barrow Plantation	National	Increased visitor disturbance	Negligible (limited public access, over 2 km from Site)	Negligible (near certain)
Ulverscroft Valley	National	Increased visitor disturbance	Negligible (restricted public access, over 2 km from Site)	Negligible (near certain)
Shepshed Cutting	Negligible	N/a	N/a	N/a
Holly Rock Fields	National	Increased visitor disturbance	Negligible (no public access)	Negligible (near certain)
Grace Dieu And High Sharpley	National	Increased visitor disturbance	Negligible (limited public access, over 2 km from Site)	Negligible (near certain)
Non-Statutory Designated Sites				
Black Brook LWS	County	Disturbance/ damage post-construction	The extent of the LWS within the Site (up to 1.22ha) could be adversely affected to some degree medium/ long term)	Local (local)
		Pollution post-construction	Could affect Black Brook and River Soar downstream of Site	County (unlikely)
		Introduction of invasive species	Low risk of significant effect	Local (unlikely)

[8] Based on 2011 Census data for Charnwood wards of Loughborough, Quorn and Shepshed.

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Hermitage Estate LWS	District	Disturbance, damage & pollution post-construction	The extent of the retained habitats within the LWS (up to 8.31ha) could be adversely affected to some degree (medium/ long term)	Local (probable)
Stonebow Washlands LWS	District	Disturbance, damage & pollution post-construction	The extent of the LWS (up to 7.48ha) could be adversely affected to some degree (medium/ long term)	Local (probable)
Booth Wood LWS	District-County	Disturbance, damage & pollution post-construction	The extent of the LWS (up to 4.23ha) could be adversely affected to some degree (medium/ long term)	Local (probable)
Hathern Road Verge (east side) Candidate LWS	District	Damage & pollution post-construction	The extent of the LWS (up to 0.21ha) could be adversely affected to some degree (medium/ long term)	Local (unlikely)
Hathern Drive Parish Level Site	Local	Disturbance, damage & pollution post-construction	The extent of the Hathern Drive Site (up to 4.55ha) could be adversely affected to some degree (medium/ long term)	Local (probable)
Baileys Plantation Parish Level Site	Local	Disturbance, damage & pollution post-construction	The extent of Bailey's Plantation (up to 6.35ha) could be adversely affected to some degree (medium/ long term). The northern section (0.81ha) is likely to be significantly affected by increased disturbance (use as a bike track) and littering/ fly tipping.	Local (probable)
Pear Tree Lane Parish Level Site	Local	Disturbance, damage & pollution post-construction	The extent of Pear Tree Lane (up to 1.43ha) could be adversely affected to some degree (medium/ long term)	Local (probable)
Woodland near the Obelisk Parish Level Site	Local	Disturbance, damage & pollution post-construction	The extent of the woodland (1.38ha) could be adversely affected to some degree (medium/ long term)	Local (probable)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Home Covert District Level Site	District	Disturbance, damage & pollution post-construction	The extent of Home Covert (10.38ha) could be adversely affected to some degree (medium/ long term)	Local (probable)
Dismantled Railway Line Parish Level Site	Local	Disturbance, damage & pollution post-construction	The extent of Disused Railway Line Site (1.94ha) could be adversely affected to some degree (medium/ long term)	Local (probable)

Effects on Habitats and Flora

10.9.6 The potential post-construction effects of the Development on habitats within the Site are presented in Table 10.17.

Table 10.17 Potential post-construction effects on habitats within the Site

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Priority/ important hedgerows	County	Incorporation into gardens/ urban settings (damage, degradation and disturbance)	The majority of hedgerows could be incorporated into residential gardens or urbanised spaces	Local (probable)
Species poor hedgerows	Local	Incorporation into gardens/ urban settings (damage, degradation and disturbance)	The majority of hedgerows could be incorporated into residential gardens or urbanised spaces	Site (probable)
Veteran, mature and notable trees	District	Incorporation into gardens/ urban settings (damage, degradation and disturbance)	The majority of trees within the development area could be incorporated into residential gardens or urbanised spaces	Local (probable)
Other trees	Local	Incorporation into gardens/ urban settings (damage, degradation and disturbance)	The majority of trees within the development area could be incorporated into residential gardens or urbanised spaces	Site (probable)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Overall woodland resource	District	Damage, disturbance and degradation as a result of increased human activity post-construction	The extent of the habitat (70.54ha) could be adversely affected to some degree (medium to long term).	Local (probable)
Meadows adjacent to Black Brook (Semi-improved neutral grassland)	Local	Damage, disturbance and degradation as a result of increased human activity post-construction	The extent of the habitat (2.88ha) could be adversely affected to some degree (medium to long term).	Local (probable)
Poor semi-improved grassland	Site	Damage, disturbance and degradation as a result of increased human activity post-construction	The extent of these habitats could be adversely affected to some degree (medium to long term).	Negligible (probable)
Arable	Negligible			
Scrub	Negligible			
Ruderal vegetation	Site			
Ditches and drains	Site			
Black Brook	County	See 'Black Brook LWS' above		County
Shortcliff Brook	Local	Disturbance, damage or pollution post-construction	The extent of the brook (up to 0.2ha) could be adversely affected to some degree medium/ long term)	Local (probable)
		Introduction of invasive species	Low risk of significant effect	Local level (unlikely)
Stream through wet woodland/ south of Oxley Gutter	Local	Disturbance, damage or pollution post-construction	The extent of the stream (up to 0.12ha) could be adversely affected to some degree medium/ long term)	Local (probable)
		Introduction of invasive species	Low risk of significant effect	Local level (unlikely)
Hermitage Estate Lake – part of Hermitage Estate LWS	District	Disturbance, damage or pollution post-construction	Could affect the extent of the lake (1.41ha) to some degree medium/ long term)	Local (probable)
		Introduction of invasive species	Low risk of significant effect	Local (unlikely)

Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect
Garendon Park (wider mosaic of habitats)	Local	Disturbance, damage or pollution post-construction	Could affect the extent of the Park (194ha) to some degree medium/ long term	Local (probable)

Effects on Fauna

10.9.7 The potential post-construction effects of the Development on fauna within and in the vicinity of the Site are presented in Table 10.18.

Table 10.18 Potential post-construction effects on fauna within the Site

Species/ Feature	Value	Potential impacts	Potential magnitude of impact	Significance of effect (Probability)
Badgers	Local	Disturbance of setts as a result of human activity and dogs	All setts within the Site may be at risk of increased disturbance, with 3 setts being retained within close proximity to the development areas.	Local (Probable)
Foraging and commuting habitats for bats	Local-District	Disturbance of habitats due to lighting	All hedgerows within the Site could be affected Habitat areas including Black Brook, Bailey's Plantation, Hathern Drive, Hermitage Estate and Home Covert could all be affected	Local (probable)
Bat roost sites	Local-District	Disturbance of roosts due to lighting	All tree and building roosts in the vicinity of development areas could be affected.	Local (probable)
Breeding and wintering birds	Local	Disturbance of nesting, roosting and foraging habitats	The extent of habitats within the Site could be adversely affected to a limited degree	Site (probable)
		Increased risk of predation by domestic cats	The extent of habitats within the Site could be adversely affected to a limited degree	Site (probable)

Otters	County	Disturbance, damage and pollution of riparian habitats post-construction	Extent of habitat (c. 4.2ha) could be adversely affected to some degree (medium/ long term)	Local (probable)
Reptiles	Local	Disturbance due to human activity	Could significantly affect viability of on-Site populations	Site (probable)
		Increased risk of predation by domestic cats	Could significantly affect viability of on-Site populations	Site (probable)
Other notable species	Local	Disturbance due to human activity	Locally occurring populations may be disturbed	Local (probable)

10.10 Mitigation

10.10.1 The potential adverse effects of the Development, as identified above, have been addressed as part of the scheme through a mitigation strategy. This follows the principle of addressing adverse effect through avoidance, then mitigation, then compensation.

Mitigation of Construction Effects

Scheme Design

10.10.2 The design of the Development has taken account of the existing features of nature conservation value within the Site, thereby avoiding potential effects and minimising the magnitude of effects where these cannot reasonably be avoided. In addition the Development has been designed to provide opportunities for creation and enhancement of habitats, features and connective networks of increased nature conservation value. Details of the principles of the design with respect to biodiversity are presented in the Green Infrastructure and Biodiversity Management Plan (GIBMP).

General Construction Measures

10.10.3 A Construction Method Statement (CMS) will be prepared which will include details of measures to be adhered to minimise potential impacts on features of nature conservation value. This will include:

- The relevant Pollution Prevention Guidelines listed below will be adhered to, to ensure construction works are undertaken in an environmentally responsible manner. Any environmentally hazardous material will be kept in dedicated stores, storage tanks will have appropriate bunding and the possibility of fuel spillages will be minimised through sound site management;
  - PPG1: General Guide to the Prevention of Pollution;
  - PPG2: Above Ground Oil Storage Tanks;
  - PPG3: Use and Design of Oil Separators in Surface Water Drainage Systems;

- PPG5: Works in, Near, or Liable to Affect Watercourses;
- PPG6: Working at Construction and Demolition-sites; and
- PPG21: Pollution Incident Response Planning;

- Due to the potential for retained habitats to be disturbed during habitat creation works, all retained habitats within the Site will be protected by erection of sturdy fencing such as Heras to avoid disturbance, accidental incursions and damage;
- All trees and hedges will be protected during works in accordance with BS 5837: 2012;
- Restrictions on working and use of lighting during the night during construction to minimise disturbance;
- Measures to ensure avoidance of risk of introduction/ transfer of invasive species.

10.10.4 Specific mitigation measures to be implemented in response to the predicted potential construction effects are presented in Table 10.19.

Table 10.19 Proposed Mitigation of Potential Construction Effects

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Designated Sites for Nature Conservation				
Black Brook LWS	Habitat loss (up to 140m2)	No supports will be placed within the river (avoidance). Bridge widths will be kept to a minimum (mitigation).	Habitats created along the Black Brook corridor will form a mosaic of high quality habitats effectively extending the area qualifying as LWS to approximately 29ha – an increase of 25.6ha (753%)	County-level Beneficial effect (probable)
	Severance/ loss of continuity of habitats	Road bridge will be designed with broad span to allow passage of wildlife along banks (mitigation) Scheme design avoids severance of river corridor from adjacent habitats (avoidance).	Habitats within the Black Brook corridor will be enhanced for biodiversity to create a corridor linking into green infrastructure throughout the Site and enhancing links to off-Site habitats (in particular Oakley Wood, Stonebow Washlands and Gorse Covert). This corridor will be between c. 275 and 500m wide and will extend from Hathern Road in the west to Stonebow Bridge and the grassland east of Bailey's Plantation in the east	Local level Beneficial effect (probable)
	Disturbance/ damage during construction	No works will be carried out within 10m of LWS, except at crossings (avoidance) Working areas will be fenced to prevent accidental incursions and damage to habitats (avoidance) No plant will enter water course (avoidance) Habitats within working areas will be restored on completion of crossings (mitigation).	-	Negligible (probable)
	Pollution during construction	All works will be carried out in accordance with the proposed CMS to ensure compliance with appropriate pollution prevention guidance (avoidance).	-	Negligible (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Introduction of invasive species	The CMS will include measures to prevent introduction of invasive species during construction (avoidance).	Reduction/ elimination of Himalayan balsam from Site	Local level Beneficial effect (probable)
Hermitage Estate LWS	Loss of habitat (2.2ha neutral grassland)	Creation of at least 4.4ha species rich neutral grassland adjacent to LWS (compensation).	-	Negligible (probable)
	Disturbance, damage & pollution during construction	Retained habitats within LWS will be fenced with a minimum buffer zone of 10m to prevent accidental incursions or damage (avoidance). Any works required within the 10m buffer zone (i.e. landscaping works) will be carried out by hand or with light plant only (avoidance). All works will be carried out under CMS (avoidance).	-	Negligible (probable)
	Isolation from associated habitats	The proposed layout connects the LWS into the Oxley Gutter-Home Covert green corridor and the restored Garendon Park (avoidance).	Enhancement of habitats within green corridors and adjacent Garendon Park	Local level Beneficial effect (probable)
	Removal of Japanese knotweed from woodland	-	Treatment of Japanese knotweed to eradicate it from the Hermitage Estate woodland	Local level Beneficial effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Stonebow Washlands LWS	Disturbance, damage & pollution during construction	Boundary of working areas adjacent to the LWS will be fenced to prevent accidental incursions or damage (avoidance). The boundary of the adjacent working area will be separated from the LWS by an existing footpath, which should allow a buffer of at least 10m (avoidance). Any works on the footpath should be carried out by hand or with light plant only (avoidance). All works will be carried out under appropriate pollution prevention measures (avoidance)	-	Negligible (probable)
	Isolation from associated habitats	The proposed layout retains connectivity between the LWS and the proposed Black Brook green corridor, the Oxley Gutter-Home Covert green corridor and the restored Garendon Park (avoidance).	Enhancement of habitats within adjacent Black Brook corridor	Local level Beneficial effect (probable)
Booth Wood LWS	Disturbance, damage & pollution during construction	No construction works are proposed within 500m of Booth Wood (avoidance).	-	Negligible (near certain)
	Isolation from associated habitats	No development is proposed in the vicinity of the LWS that could isolate it from associated habitats (avoidance).	Enhancement of habitats within adjacent Garendon Park	Local level Beneficial effect (probable
Hathern Road Verge (east side) Candidate LWS	Damage & pollution during construction	No development is proposed within 50m of the cLWS (avoidance). No plant will track across the road verge within the cLWS (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Isolation from associated habitats	No development is proposed in the vicinity of the cLWS that could isolate it from associated habitats (avoidance)	Increased value value of habitats connecting to the cLWS	Local level Beneficial effect (probable)
Hathern Drive Parish Level Site	Loss of approximately 0.06ha	Planting of over 0.12ha of woodland connected to Hathern Drive in the proposed Bellevue Hill Wood (compensation).	-	Negligible (probable)
	Disturbance, damage & pollution during construction	Boundary of working areas adjacent to Hathern Drive will be fenced during works with a buffer of at least 10m to prevent accidental incursions or damage (avoidance). Any works such as footpath improvement within Hathern Drive should be carried out with light plant (mitigation). All works will be carried out under CMS (avoidance/ mitigation).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Severance and isolation from associated habitats	The northern part of Hathern Drive will link into the proposed Bellevue Hill Wood green corridor (avoidance). The southern part of Hathern Drive will link into the Black Brook green corridor (avoidance). The width of the access road will be kept to a minimum where it crosses Hathern Drive (mitigation). Trees adjacent to the access road will be retained and managed to form a 'hop-over' (see under 'Bats' below) (avoidance/mitigation). Lighting at the crossing point will be shielded and low level to avoid illumination of the adjacent habitats and tree canopy (mitigation).	New woodland planting adjacent to Hathern Drive will enhance the value of connected habitats	Local level Beneficial effect
Baileys Plantation Parish Level Site	Disturbance, damage & pollution during construction	Boundary of working areas adjacent to Bailey's Plantation will be fenced during works with a buffer of at least 10m to prevent accidental incursions or damage (avoidance). All works will be carried out under CMS (avoidance).	-	Negligible (probable)
	Isolation from associated habitats	Bailey's Plantation will form part of the Black Brook green corridor (compensation). Creation of a wildlife underpass crossing the proposed Strategic Link Road to the north of Bailey's Plantation should be considered (mitigation).	-	Negligible (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Pear Tree Lane Parish Level Site	Disturbance, damage & pollution during construction	Boundary of working areas adjacent to Pear Tree Lane will be fenced during works with a buffer of at least 10m to prevent accidental incursions or damage (avoidance). All works will be carried out under appropriate pollution prevention measures (avoidance).	-	Negligible (probable)
	Isolation from associated habitats	Pear Tree Lane will form part of the Black Brook green corridor (compensation).	-	Negligible (probable)
Woodland near the Obelisk Parish Level Site	Disturbance, damage & pollution during construction	No development works are proposed within 500m of the woodland (avoidance).	-	Negligible (probable)
	Isolation from associated habitats	No works are proposed that could isolate the woodland from associated habitats (avoidance).	Enhancement of adjacent habitats in Garendon Park	Site level Beneficial effect (probable)
Home Covert District Level Site	Loss of c. 1ha	Planting of over 2.0ha of woodland connected to Home Covert (compensation).	-	Negligible (probable)
	Disturbance, damage & pollution during construction	Boundary of working areas adjacent to Home Covert will be fenced during works with a buffer of at least 10m to prevent accidental incursions or damage (avoidance). All works will be carried out under CMS (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Severance and isolation from associated habitats	The eastern part of Home Covert will form part of a green corridor and the restored Garendon Park (compensation). The western part of Home Covert will become part of the Western Boundary green corridor (compensation). The width of the Strategic Link Road will be kept to a minimum through the woodland with adjacent tress retained to reduce the separation of the canopy (mitigation). A wildlife underpass crossing the Strategic Link Road should be considered within or adjacent to the woodland (mitigation). Enhancement of habitats in Garendon Park will increase the value of connected habitats (compensation).	-	Negligible (near certain)
Dismantled Railway Line Parish Level Site	Loss of c. 0.3ha	Planting of over 0.6ha of woodland connected to the Disused Railway Line (compensation).	Over 0.7ha additional woodland planting adjacent to the Disused Railway Line	Local level Beneficial effect (probable)
	Disturbance, damage & pollution during construction	Boundary of working areas adjacent to the Disused Railway Line will be fenced during works with a buffer of at least 10m to prevent accidental incursions or damage (avoidance). All works will be carried out under CMS (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Severance and isolation from associated habitats	The eastern part of the railway line will remain connected to woodland areas along the eastern boundary of Garendon Park, with additional woodland planting (avoidance/compensation). The western part of the railway line will form part of the western boundary green corridor, with additional woodland planting (compensation) The bridge over Shortcliff Brook will allow wildlife to cross under the Strategic Link Road 130m from the railway line, with proposed woodland planting in the intervening habitats (mitigation). The width of the Strategic Link Road will be kept to a minimum through the railway line with adjacent trees retained to reduce the separation of the canopy (mitigation).	Woodland planting adjacent to the railway line	Local level beneficial effect
Habitats and Flora				
Priority/ important hedgerows	Loss of 2278m	Planting of 4556m (2:1) replacement species rich hedgerow (compensation).	Planting of additional species rich hedgerow within proposed GI and Garendon Park	Local adverse (short term); Local beneficial (medium-long term) (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Severance and isolation from associated habitats	Access through hedgerows to be minimised and of minimal width. 'Hop-overs' may be used where appropriate (see 'Bats' below) (mitigation). New hedgerow planting and GI will reinforce connective corridors (compensation). Gaps in existing hedgerows will be planted with appropriate native species (compensation).	-	Negligible (near certain)
	Disturbance/ damage during construction	All retained hedgerows will be protected using Heras fencing during works (avoidance).	-	Negligible (near certain)
Species poor hedgerows	Loss of 1516m	Planting of 1516m replacement species rich hedgerow (compensation).	-	Negligible (probable)
	Severance and isolation from associated habitats	Access through hedgerows to be minimised and of minimal width. 'Hop-overs' may be used where appropriate (see 'Bats' below) (mitigation). New hedgerow planting and GI will reinforce connective corridors (compensation). Gaps in existing hedgerows will be planted with appropriate native species (compensation).	-	Negligible (near certain)
	Disturbance/ damage during construction	All retained hedgerows will be protected using Heras fencing during works (avoidance)	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Veteran, mature and notable trees	Loss of 9 mature/ notable trees and partial loss of 5 notable groups	Presumption should be in favour of the retention of all trees, including those classified as 'unsuitable for retention' (U) under the arboricultural assessment, wherever possible, with tree surgery as may be necessary (avoidance) Planting of replacement trees at a ratio of 3:1 (compensation).	-	Negligible (probable)
	Isolation from associated habitats	New planting and GI will reinforce connective corridors (compensation).	-	Negligible (near certain)
	Disturbance/ damage during construction	All retained trees will be protected according to BS 5837: 2012 during works (avoidance).	-	Negligible (near certain)
Other trees	Loss of 7 individual trees and 5 groups of trees (in part)	Planting of replacement trees (compensation).	Planting of additional new trees	Site/ Local level Beneficial effect (probable)
	Isolation from associated habitats	New planting and GI will reinforce connective corridors (compensation).	-	Negligible (near certain)
	Disturbance/ damage during construction	All retained trees will be protected according to BS 5837: 2012 during works (avoidance).	-	Negligible (near certain)
Overall woodland resource	Loss of 0.97haha	Replacement with 1.94ha (2:1) new native woodland planting (compensation).	c. 28ha additional woodland planting	Local level Beneficial effect (probable)
	Disturbance/ damage during construction	Retained woodland areas will be buffered and protected during works using fencing (e.g. Heras) and according to BS 5837: 2012 (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Isolation from associated habitats	New planting and GI will reinforce connective corridors (compensation).	Enhancement of adjacent habitats within Green Infrastructure	Local level Beneficial effect (probable)
Meadows adjacent to Black Brook (Semi-improved neutral grassland)	Loss of c. 0.18ha	Creation of 0.36ha (2:1 replacement) species-rich grassland (compensation).	2.38ha additional species rich grassland creation adjacent to meadows within Black Brook Corridor (see Black Brook LWS above).	Negligible (probable)
	Disturbance, damage & pollution during construction	Boundary of adjacent working areas will be fenced during works to prevent accidental incursions or damage (avoidance). All works will be carried out under appropriate pollution prevention measures (avoidance/ mitigation).	-	Negligible (near certain)
Hermitage Meadow (part of LWS)	Loss of 2.2ha	Creation of 4.4ha (2:1 replacement) species-rich grassland (compensation).	-	Negligible (near certain)
Poor semi-improved grassland	Loss of 7.2ha	Creation of 7.2ha species-rich grassland (compensation).	Creation of up to c. 25.6ha additional species rich grassland and habitat mosaics within Black Brook corridor (see Black Brook LWS above) Creation of additional species rich grassland within GI and Garendon Park.	Local-District level Beneficial effect
Arable farmland	Loss of c. 250ha for development, plus habitat enhancement areas	Negligible effect; retained farmland will be managed for nature conservation (see post-construction effects, below).	-	Negligible (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Scrub	Loss	Negligible effect; planting of scrub within green infrastructure.	-	Negligible (near certain)
Ruderal vegetation	Loss	Negligible effect; creation of areas of unmanaged vegetation in within green infrastructure.	-	Negligible (near certain)
Black Brook	See 'Black Brook LWS' above			
Shortcliff Brook	Habitat loss of up to c. 100m2	Crossing will be a bridge, not a culvert (mitigation). Bridge width will be kept to a minimum (mitigation). No supports will be placed within the river (mitigation).	-	Negligible (probable)
	Severance/ loss of continuity of habitats	Road bridge will be designed with broad span to allow passage of wildlife along banks (mitigation). No development in vicinity of brook to separate it from adjacent habitats (avoidance).	Adjacent habitats will be enhanced for biodiversity and linked to green infrastructure	Local level Beneficial effect (probable)
	Disturbance/ damage during construction	No works will be carried out within 10m of brook, except at crossings (avoidance). Working areas will be fenced to prevent accidental incursions and damage to habitats (avoidance). No plant will enter water course (avoidance). Habitats within working areas will be restored on completion of crossings (compensation).	-	Negligible (probable)
	Pollution during construction	All works will be carried out in accordance the proposed CMS to ensure compliance with appropriate pollution prevention guidance (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Introduction of invasive species	CMS will include measures to prevent introduction of invasive species during construction (avoidance).	-	Negligible (near certain)
Stream through wet woodland/ south of Oxley Gutter	Habitat loss of up to c. 30m2	Crossing will be a bridge, not a culvert (mitigation). Bridge width will be kept to a minimum (mitigation). No supports will be placed within the river (mitigation). Riparian habitats will be enhanced through long term management (compensation).	-	Negligible (near certain)
	Severance/ loss of continuity of habitats	Footbridge will be designed with a wildlife ledge underneath to allow passage of wildlife under the bridge (mitigation). No development in vicinity of brook to separate it from adjacent habitats (avoidance).	-	Negligible (near certain)
	Disturbance/ damage during construction	No works will be carried out within 10m of brook, except at crossings (avoidance). Working areas will be fenced to prevent accidental incursions and damage to habitats (avoidance). No plant will enter water course (avoidance). Habitats within working areas will be restored on completion of crossings (compensation).	-	Negligible (near certain)
	Pollution during construction	All works will be carried out in accordance the proposed CMS to ensure compliance with appropriate pollution prevention guidance (avoidance)	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Introduction of invasive species	CMS will include measures to prevent introduction of invasive species during construction (avoidance).	-	Negligible (near certain)
Ditches and drains	Negligible loss	-	Site drainage strategy will provide swales and SUDS features of biodiversity value.	Site beneficial (probable)
Hermitage Estate Lake – Part of Hermitage Estate LWS	Disturbance, pollution during construction	No construction works proposed in the vicinity of the lake (avoidance). Any minor works to be fenced adjacent to the lake and associated habitats (avoidance). All works will be carried out in accordance the proposed CMS to ensure compliance with appropriate pollution prevention guidance (avoidance).	-	Negligible (near certain)
	Introduction of invasive species	CMS will include measures to prevent introduction of invasive species during construction (avoidance).	-	Negligible (near certain)
Garendon Park (wider mosaic of habitats)	Loss of habitats due to road construction - 2ha arable farmland, 0.94ha woodland and 30m hedgerow	Loss of habitats will be compensated for by creation of suitable habitats within the Site (see separate habitat accounts above) (except arable land of negligible nature conservation value) (compensation).	Additional creation of habitats including planting of woodland and grassland for nature conservation and hedgerow in place of some of the existing arable farmland	District level Beneficial effect (probable)
	Isolation and fragmentation of habitats	Installation of wildlife culverts under the Strategic Link Road (mitigation). Planting of woodland, hedgerows and field margins to increase connectivity of habitats (compensation).	Linking habitats into proposed GI network to increase connectivity of habitats in Garendon Park to habitats across the Site and wider environs	Local level Beneficial effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Disturbance, pollution during construction	All works will be carried out in accordance with the proposed CMS to ensure compliance with appropriate pollution prevention guidance (avoidance).	-	Negligible (near certain)
Fauna				
Badgers	Loss of setts - 1 Main sett and two associated annex setts, plus loss of up to 6 outlier setts	All setts to be lost will be closed under licence from Natural England, with appropriate monitoring, to avoid harm to badgers (avoidance). The main sett and associated annex setts will be replaced with new setts to be constructed in proposed Bellevue Hill Wood (compensation).	-	Negligible (near certain)
	Disturbance of setts during construction	Where possible, setts will be protected from construction disturbance by fencing off with an appropriate buffer. If design requirements cannot accommodate a sufficient buffer, then works will be carried out under a method statement or affected setts would be temporarily closed (under a licence) until the works are completed (avoidance).	-	Negligible (near certain)
	Loss of foraging habitats	Bellevue Hill Wood and woodland at Lounds Farm and along Hathern Drive will be created to provide optimal foraging resources for badgers (see Appendix 10.4) to compensate for loss of arable habitats in the north of the Site (compensation). Bunker Hill Wood will compensate for loss of arable habitat in the west of the Site (compensation). Habitats within the proposed Green Infrastructure network and restored Garendon Park will also provide new foraging habitats (compensation).	-	Site level Adverse effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Severance of habitats and territories; risk of increased mortality rates due to traffic.	Wildlife crossing points will be incorporated into the design of the Strategic Link Road at key linkage points (see Appendix 10.4 and Figure 10.8 which will ensure connectivity of habitats for badgers is maintained (mitigation).	-	Negligible (near certain)
Foraging habitats for bats	Loss of foraging habitats- poor quality farmland habitat and 3.8km hedgerow	Creation of woodland, pasture and hedgerows and enhancement of arable land (compensation).	Increase in total area of higher quality foraging habitats.	Local level Beneficial effect (probable)
	Disturbance of foraging habitats during construction	Retained habitats will be protected with fencing and buffered from development. CMS will include restrictions to working hours and lighting will be restricted and shielded to minimise light spill (avoidance/mitigation).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Commuting routes for bats	Loss/ severance of commuting routes	Green infrastructure will ensure corridors for movement are maintained (compensation). Where appropriate, consideration will be given to creation of 'hop-overs' at the locations of larger gaps in hedgerows and woodland areas to minimise severance of commuting routes. These measures are listed in Highways Agency Interim Advice Note Nature Conservation Advice in Relation to Bats. (Mitigation) The Black Brook Bridge will allow a clearance of c. 1.4 – 2.0m above bank-top level, which would allow bats to pass under the bridge under normal conditions. Where lighting is required on the bridge and through the Black Brook corridor, this will be designed in consultation with an ecologist to minimise the potential to deter bats from crossing, while encouraging them to fly above the traffic level. (Mitigation)	-	Negligible (near certain)
	Disturbance of commuting routes during construction	Retained habitats will be protected with fencing and buffered from development. CMS will include restrictions to working hours and lighting will be restricted and shielded to minimise light spill (avoidance).	-	Negligible (near certain)
Bat roost sites	Loss of roost sites	Scheme design has taken account of potential roost sites and these will be retained in the Development (avoidance).	Installation of bat boxes on trees throughout green spaces and roost features into buildings within the scheme (see Appendix 10.5 for recommendations).	Local level Beneficial effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Disturbance of roost sites during construction	Retained habitats will be protected with fencing and buffered from development. The CMS will include restrictions to working hours and lighting will be restricted and shielded to minimise light spill (avoidance/ mitigation).	-	Negligible (near certain)
Breeding birds	Loss of approximately 250ha of habitat for birds of open farmland and 2.5ha of habitat for birds of woodland and hedgerows	Creation of c. 5ha woodland and hedgerow (2:1 replacement) (compensation). Maintenance of c.125ha of land in agricultural management for biodiversity, with particular enhancement for farmland (to be implemented through the GIBMP) (compensation).	Installation of bird boxes on trees throughout green spaces and nest features into buildings within the scheme Creation of additional hedgerow and c. 25ha woodland.	Beneficial effect on birds of woodland, scrub and grassland habitats at a local level (probable)
				Adverse effect on arable farmland birds at a Site/ local level (near certain)
	Reduction in value of habitats due to disturbance during construction	Retained habitats will be protected with fencing and buffered from development. CMS will include restrictions to working hours and lighting will be restricted and shielded to minimise light spill (avoidance/ mitigation).	-	Negligible (near certain)
	Disturbance of nesting birds during construction	Vegetation clearance will be carried out outside the bird nesting season. Otherwise habitats will be inspected by an ecologist immediately prior to removal and if evidence of nesting birds is found, vegetation will be retained until all young have fledged (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Wintering birds	Loss of suitable foraging habitats – c. 250ha of habitat for birds of open farmland and 2.5ha of habitat for birds of woodland and hedgerows	Creation of c. 5ha woodland and hedgerow (2:1 replacement) (compensation). Maintenance of c.125ha of land in agricultural management for biodiversity, with particular enhancement for farmland birds (to be implemented through the GIBMP) (compensation).	Installation of bird boxes on trees throughout green spaces and nest features into buildings within the scheme will also provide roosting opportunities for wintering birds. Creation of additional hedgerow and c. 25ha woodland. Planting of species of foraging value for wintering birds including berry and nut bearing shrubs and trees and seed-rich grassland within GI.	Beneficial effect on birds of woodland, scrub and grassland habitats at a local level (probable) Adverse effect on arable farmland birds at a Site/ local level (near certain)
	Disturbance of foraging habitats and roost sites during construction	Retained habitats will be protected with fencing and buffered from development. CMS will include restrictions to working hours and lighting will be restricted and shielded to minimise light spill (avoidance/ mitigation).	-	Negligible (near certain)
Otters	Loss of habitat (up to around 140m2)	Bridge widths will be kept to a minimum (mitigation). No supports will be placed within the river (mitigation).	Enhancement and protection of bank-side habitats for otters	Local level Beneficial effect (probable)
	Severance/ loss of continuity of habitats	Road bridge will be designed with broad span to allow passage of wildlife along banks (mitigation). Otter ledges will be installed under the bridge to allow passage even during flood events (mitigation). GI provides habitat links between Black Brook corridor and lake via Oxley Gutter and Hathern Drive, which will be enhanced through planting to provide cover (compensation).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Damage to holts/ resting places and habitats, pollution of habitats and disturbance of otters during construction	No works will be carried out within 10m of the Black Brook, except at crossings (avoidance). All bridge works will be carried out under a method statement to minimise the risk of disturbance to otters or severance of commuting routes during construction works. Working areas will be re-checked for evidence of resting places prior to work being carried out (avoidance). Working areas will be fenced to prevent accidental incursions and damage to habitats (avoidance). No plant will enter water course or lake (avoidance). Bridge construction works will be subject to restricted working hours and he construction method statement for the bridge will include measures to ensure otters are able to move freely along the Black Brook during non-working hours. Habitats within working areas will be restored on completion of crossings (compensation). All works will be carried out under CMS to ensure compliance with pollution prevention guidance (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Reptiles	Loss and severance of habitat - c. 0.2 of suitable habitats could be lost. Separation of habitats east and west of the proposed Strategic Link Road	Habitats along Black Brook where grass snake were recorded will be retained within GI (avoidance). Creation of equivalent areas of new habitat (compensation). GI strategy will ensure connectivity of habitats (mitigation).	Creation and enhancement of habitats within Green Infrastructure will provide increase in suitable habitats	Site level Beneficial effect (probable)
Other notable species	Loss and severance of habitat - c. 2.5ha of hedgerow and woodland habitats and loss of low value farmland	Creation of new habitats within GI (compensation). GI strategy will ensure connectivity of habitats (mitigation).	Creation and enhancement of habitats within Green Infrastructure will provide increase in overall value of habitats for a wider diversity of species.	Site level Beneficial effect (probable)
	Disturbance during construction	Retained habitats will be protected with fencing and buffered from development (avoidance).	-	Negligible (near certain)

Mitigation of Post-Construction Effects

10.10.5 Mitigation of post-construction effects will largely be through appropriate management of the Green Infrastructure within the Site. This will be delivered through a management company to be set up specifically for the management of the Development. Agricultural land will be maintained as tenanted farmland and managed under prescriptions for biodiversity benefit set out in the GIBMP. The GIBMP will include plans for the management of the Site for biodiversity including management of:

- Informal public spaces;
- Non-agricultural areas for biodiversity (i.e. the Black Brook and associated habitats, other streams and watercourses, woodland areas);
- Surface water drainage features (SUDS ponds, swales etc.);
- Pastoral farmland;
- Arable farmland; and
- Hedges, trees and structural planting.

10.10.6 Specific mitigation measures to be implemented in response to the predicted potential post-construction effects are presented in Table 10.20.

Table 10.20 Proposed Mitigation of Potential Post Construction Effects

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Statutory Designated Sites				
Beacon Hill, Hangingstone & Outwoods SSSI	Increased visitor disturbance	Provision of extensive green space and recreational facilities within the Site (mitigation). Enhancement of access to Garendon Park for recreation (mitigation).	-	Negligible (probable)
Oakley Wood SSSI	Increased visitor disturbance	Negligible effect – no mitigation required.	Creation of woodland within the north-west of the Site will extend woodland habitat connectivity towards Oakley Wood and increase the woodland resource associated with Oakley Wood.	Local (probable)
Non-Statutory Designated Sites				
Black Brook LWS	Disturbance/ damage post-construction	Public access along banks will be restricted along one bank along most of its length (avoidance). Footpaths and access routes will be provided that will guide public usage away from sensitive areas (avoidance).	Long-term management of habitats within the Black Brook corridor will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Pollution post-construction	Foul sewerage will be designed to ensure there is no untreated discharge to the Black Brook (avoidance/ mitigation). Surface water drainage will be designed to prevent polluted run-off directly entering the Black Brook (avoidance/ mitigation) No houses or employment within 100m of the brook (to discourage fly tipping) (avoidance). Litter bins will be provided throughout the Black Brook corridor (mitigation). Agricultural and amenity land management will follow best practices in protecting watercourses to prevent pollution from fertilisers or pesticides (avoidance/ mitigation). Retained habitats will be managed to maintain and enhance biodiversity value (compensation).	-	Negligible (near certain)
	Introduction of invasive species	GIBMP will include monitoring of watercourses for invasive species (avoidance).	Biodiversity Management Plan will include measures to reduce/ eliminate Himalayan balsam from the Site	Local level Beneficial effect (probable)
Hermitage Estate LWS	Disturbance, damage & pollution post-construction	Access to woodland and lake to be restricted to formal footpaths and access tracks. New grassland areas to be restricted access under managed grazing (avoidance).	Long-term management of habitats within the LWS will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)
Stonebow Washlands LWS	Disturbance, damage & pollution post-construction	Extensive public open space within the development will provide alternative locations for residents to use (compensation). The LWS is already within an urban setting and additional visitors are unlikely to significantly increase the levels of disturbance.	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Booth Wood LWS	Disturbance, damage & pollution post-construction	The nearest proposed residential plots will be over 900m from Booth Wood, separated by Garendon Park, which will provide public green space (avoidance/ compensation).	-	Negligible (near certain)
Hathern Road Verge (east side) Candidate LWS	Damage & pollution post-construction	The LWS will be screened from the development by new woodland planting (compensation).	-	Negligible (near certain)
Hathern Drive Parish Level Site	Disturbance, damage & pollution post-construction	A buffer of 10m will be retained between development areas and Hathern Drive (avoidance). Litter bins will be provided along the footpath (mitigation). Lighting will be designed to avoid Illumination of habitats/ tree canopy (mitigation). A lighting strategy will include measures to ensure there is no significant light disturbance of habitats. The creation of Bellevue Hill Wood will provide 6.25ha of alternative habitat for species currently using the Hathern Drive Site to move into during times of disturbance (compensation).	Long-term management of habitats within the LWS will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Baileys Plantation Parish Level Site	Disturbance, damage & pollution post-construction	No development is proposed within 50m of Bailey's Plantation, except one plot adjacent to the northern section (avoidance). A buffer of 10m will be retained between development areas and Bailey's Plantation (avoidance). Lighting will be designed to avoid Illumination of habitats (mitigation). A lighting strategy will include measures to ensure there is no significant light disturbance of habitats. Use of the northern section as an off-road bicycle facility will help to reduce littering/ fly tipping (mitigation). Long-term management of the woodland for biodiversity and additional planting will increase the value of the main southern part of the woodland, which will compensate for disturbance to the northern section (compensation).	Long-term management of habitats within the LWS will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Pear Tree Lane Parish Level Site	Disturbance, damage & pollution post-construction	A buffer of 10m will be retained between development areas and Pear Tree Lane (avoidance). Litter bins will be provided along the footpath (mitigation). Lighting will be designed to avoid illumination of habitats/ tree canopy (mitigation). A lighting strategy will include measures to ensure there is no significant light disturbance of habitats. Creation and enhancement of habitats adjacent to Pear Tree Lane will provide alternative habitats for species present to move into during periods of disturbance (compensation).	Long-term management of habitats within the LWS will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)
Woodland near the Obelisk Parish Level Site	Disturbance, damage & pollution post-construction	No development works are proposed within 500m of the woodland (avoidance).	Long-term management of habitats within the LWS will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)
Home Covert District Level Site	Disturbance, damage & pollution post-construction	The nearest development plot will be over 20m from Home Covert and will be screened with structural planting (avoidance/ mitigation). There will be no direct public access to Home Covert (avoidance). Lighting will be designed to avoid illumination of habitats/ tree canopy (mitigation). A lighting strategy will include measures to ensure there is no significant light disturbance of habitats.	Long-term management of habitats within the LWS will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Dismantled Railway Line Parish Level Site	Disturbance, damage & pollution post-construction	No development is proposed within 500m of the Disused Railway Line (avoidance). Lighting of the road where it crosses will be designed to avoid illumination of habitats/ tree canopy (mitigation). A lighting strategy will include measures to ensure there is no significant light disturbance of habitats.	Long-term management of habitats adjacent to the LWS will improve the habitat network associated with the LWS and protect against potential future degradation	Local level Beneficial effect (probable)
Habitats and Flora				
Priority/ important hedgerows	Incorporation into gardens/ urban settings (damage, degradation and disturbance)	Hedgerows will not be incorporated into gardens (avoidance). Hedgerows will be buffered from development (avoidance).	Long-term management to improve quality of hedgerows	Local level Beneficial effect (probable)
Species poor hedgerows	Incorporation into gardens/ urban settings (damage, degradation and disturbance)	Hedgerows will not be incorporated into gardens (avoidance). Hedgerows will be buffered from development (avoidance).	Long-term management to improve quality of hedgerows	Local level Beneficial effect (probable)
Veteran, mature and notable trees	Incorporation into gardens/ urban settings (damage, degradation and disturbance)	Trees will not be incorporated into gardens (avoidance). Trees will be buffered from development (avoidance).	-	Negligible (near certain)
Other trees	Incorporation into gardens/ urban settings (damage, degradation and disturbance)	Trees will not be incorporated into gardens (avoidance). Trees will be buffered from development (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Overall woodland resource	Damage, disturbance and degradation as a result of increased human activity post-construction	Public footpaths and permissive routes will be provided and signed to encourage access away from sensitive areas (mitigation). Hedges and fencing will be used where appropriate to restrict access (avoidance).	Long-term management of woodland habitats within the LWS will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)
Meadows adjacent to Black Brook (Semi-improved neutral grassland)	Damage, disturbance and degradation as a result of increased human activity post-construction	Public footpaths and permissive routes will be provided and signed to restrict the area affected by trampling and disturbance (mitigation). Dogs to be kept on the lead in these areas (mitigation). Litter bins will be provided at suitable locations (mitigation).	Long-term management of grassland habitats will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)
New species-rich grassland	Damage, disturbance and degradation as a result of increased human activity post-construction	Public footpaths and permissive routes will be provided and signed to restrict the area affected by trampling and disturbance (mitigation). Dogs to be kept on the lead in sensitive areas (mitigation). Litter bins will be provided at suitable locations (mitigation).	-	Negligible (near certain)
Black Brook	See 'Black Brook LWS' above			

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Shortcliff Brook	Disturbance, damage or pollution post-construction	The brook will be fenced for most of its length to prevent livestock and public access to the banks (avoidance). Footpaths and access routes will be provided that will guide public usage (mitigation). Agricultural land management will follow best practices in protecting watercourses (avoidance/ mitigation).	-	Negligible (near certain)
	Introduction of invasive species	GIBMP will include monitoring of watercourses for invasive species (avoidance).	Ongoing monitoring will provide protection against potential future colonisation by invasive species	Site level Beneficial effect (probable)
Stream through wet woodland/ south of Oxley Gutter	Disturbance, damage or pollution post-construction	A strip of rough vegetation will be maintained by low-level rotational management adjacent to the bank-top, which will discourage excessive access to the brook (mitigation). Footpaths and access routes will be provided that will guide public usage (mitigation). Land management will follow best practices in protecting watercourses (avoidance).	-	Negligible (near certain)
	Introduction of invasive species	GIBMP will include monitoring of watercourses for invasive species (avoidance).	Ongoing monitoring will provide protection against potential future colonisation by invasive species	Site level Beneficial effect (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Hermitage Estate Lake – part of Hermitage Estate LWS	Disturbance, damage or pollution post-construction	Access to the lake will be restricted to specific sections; footpaths and access routes will be provided that will guide public usage (avoidance/ mitigation). Other sections will be protected by fencing or vegetation management (avoidance). Litter bins will be provided (mitigation). Land management will follow best practices in protecting watercourses (avoidance). Surface water drainage will be designed to prevent polluted run-off directly entering the Lake (mitigation).	Long-term management of habitats will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)
	Introduction of invasive species	GIBMP will include monitoring of watercourses for invasive species (avoidance).	Ongoing monitoring will provide protection against potential future colonisation by invasive species	Site level Beneficial effect (probable)
Garendon Park (wider mosaic of habitats)	Disturbance, damage or pollution post-construction	Public footpaths and permissive routes will be provided and signed to encourage access away from sensitive areas (mitigation). Hedges and fencing will be used where appropriate to restrict access (avoidance). Litter bins will be provided at appropriate location (mitigation). Dogs to be kept on the lead in sensitive areas (mitigation).	All habitats within the park will be managed under the GIBMP for nature conservation. This will provide significant improvements in the management and subsequent quality of habitats within the park and in the GI throughout the Site.	Local-District level Beneficial effect (County level Beneficial effect in combination with proposed habitat creation within the Park and GI) (probable)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
Fauna				
Badgers	Disturbance of setts as a result of human activity and dogs	Setts retained within close proximity to development, and the new sett in Bellevue Hill Wood will be protected by planting of dense shrubs (e.g. blackthorn) and fenced if necessary to minimise risk of disturbance (mitigation). Depending on the design of proposed recreational facilities in the northern part of Bailey's Plantation, it may be necessary to relocate the setts in this location (mitigation).	-	Negligible (near certain)
Foraging and commuting habitats for bats	Disturbance of habitats due to lighting	A lighting strategy will include measures to ensure there is no significant light disturbance of habitats (mitigation). Low level lighting will be used where necessary for safety along green corridors and lighting at strategic crossing points and 'hop-overs' will be designed to discourage bats flying below the vegetation line and minimise the risk of road collision mortality (mitigation).	-	Negligible (near certain)
Bat roost sites	Disturbance of roosts due to lighting	Lighting will be designed to avoid illumination of potential roost features (mitigation). A lighting strategy will include measures to ensure there is no significant light disturbance of habitats (mitigation).	-	Negligible (near certain)
Breeding and wintering birds	Disturbance of nesting, roosting and foraging habitats	Buffers to retained habitats will minimise the effects of disturbance on hedgerow and tree nesting species (avoidance). Notable ground nesting species are limited to skylark and possible grey partridge, which will depend on the agricultural areas, where public access will be limited (avoidance).	-	Negligible (near certain)

Feature	Potential Effect	Proposed Mitigation	Proposed Enhancements	Residual Effect
	Increased risk of predation by domestic cats	The creation and enhancement of habitats within the Site, particularly in Garendon Park away from the proposed residential development will significantly mitigate the effects of cat predation (compensation).	-	Negligible (near certain)
Otters	Disturbance, damage and pollution of riparian habitats post-construction	Public access along banks will be restricted along one bank of the Black Brook along most of its length and to the wet woodland and western bank of Hermitage Lake (avoidance). Footpaths and access routes will be provided that will guide public usage away from sensitive areas (mitigation). The drainage strategy will avoid polluted discharge to the Brook and Lake (mitigation) Litter bins will be provided (mitigation)	Long-term management of riparian habitats will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)
Reptiles	Disturbance due to human activity	Access will be restricted to habitats along much of the Black Brook (avoidance). New habitats will be created within Garendon Park and Black Brook corridor that will be largely undisturbed (compensation).	-	Negligible (near certain)
	Increased risk of predation by domestic cats	The creation of new habitat areas away from the proposed residential development will significantly increase the available habitat, which will mitigate for the increased predation risk (compensation).	-	Negligible (near certain)
Other notable species	Disturbance due to human activity	The creation and enhancement of habitats away from the residential developments, including agricultural land with restricted access (compensation).	Long-term management of habitats will improve habitat quality and protect against potential future degradation	Local level Beneficial effect (probable)

10.11 Summary of Residual Effects

Designated Sites for Nature Conservation

10.11.1 The creation and enhancement of habitats along the Black Brook corridor will increase the value of habitats connecting to the Black Brook LWS. A mosaic of up to approximately 29ha habitats will be created within the Black Brook corridor, including species-rich and structural grassland, scrub, wetland, riparian habitats and farmland managed for biodiversity (grazed pasture and/ or arable farmland). This will result in an overall significant increase in the nature conservation value of the network of habitats associated with the LWS and effectively increase the area qualifying as LWS by up to 25.6ha (753%). The long term management of the habitats within the corridor will protect these habitats against potential future degradation. As a result the Development will result in a significant beneficial effect on the nature conservation value of the LWS at a County level. The likelihood of this effect is probable.

10.11.2 Appropriate bridge design (broad span to allow fauna to move underneath along the banks and in adjacent habitats) will mitigate severance effects of the proposed road crossing and enhancement of habitats will enhance the overall connectivity of habitats along the Black Brook corridor. This will result in a significant beneficial effect at a Local level. The likelihood of this effect is probable.

10.11.3 The enhancement of these habitats will also increase the value of the network of habitats associated with Stonebow Washlands LWS. As a result the Development will result in a significant beneficial effect on the nature conservation value of the LWS at a Local level. The likelihood of this effect is probable.

10.11.4 As part of the CMS and the GIBMP, a programme for the eradication of Himalayan Balsam along the Black Brook will be implemented. The removal of this invasive species from the Black Brook LWS will help to restore native vegetation and will result in a significant beneficial effect on the nature conservation value of the LWS at a Local level. Japanese Knotweed present within the Hermitage Estate LWS will also be treated and eradicated and Rhododendron in Home Covert will be removed as part of woodland management, resulting in a significant beneficial effect at a Local level. The likelihood of these effects is near-certain.

10.11.5 The enhancement of habitats within the restored Garendon Park will improve the nature conservation value of the network of habitats associated with the Hermitage Estate LWS and Booth Wood LWS. In addition, long-term management of the habitats within the Hermitage Estate LWS will improve habitats and protect against potential future degradation. As a result the Development will result in a significant beneficial effect on the nature conservation value of these LWS at a Local level. The likelihood of this effect is probable.

10.11.6 Loss of grassland within the Hermitage Estate LWS (2.2ha) will be compensated by enhancement of cattle grazed semi-improved pastures (4.4ha) adjacent to the south-east of the LWS. This will be implemented through the GIBMP and could include plug planting, re-seeding and long-term management.

10.11.7 Enhancement of habitats within the Black Brook corridor and planting of woodland along Hathern Road will improve the nature conservation value of the network of habitats associated with the Hathern Road Verge (east) cLWS and will result in a significant beneficial effect on the nature conservation value of the cLWS at a Local level. The likelihood of this effect is probable.

10.11.8 Enhancement of habitats within the proposed GI will also enhance the nature conservation value of the networks of habitats associated with Parish-level sites within and adjacent to the Site. It is likely that with appropriate management and enhancement, these habitats could qualify under the primary or secondary criteria for Wildlife Site selection and form mosaics of habitats of value equivalent to a LWS. As a result the Development will result in a significant beneficial effect on the nature conservation value of these sites at a Local level. The likelihood of this effect is probable.

Habitat Corridors and Connectivity

10.11.9 The creation of a broad corridor of enhanced habitats along the Black Brook at the core of a network of green corridors throughout the Site and the creation and enhancement of habitats within Garendon Park will significantly increase the connectivity of habitats across the Site and between features in the wider landscape (including Oakley Wood SSSI), in accordance with the emerging Charnwood Core Strategy.

Habitats and Flora

10.11.10 Detailed design of the proposed GI will include provision of new hedgerow planting. All new hedgerows will be species rich and all new and existing hedgerows will be managed in the long term for biodiversity. The hedgerow planting scheme will aim to create at least 6km of new hedgerow, which will provide replacement of high quality hedgerows to be lost on a 2:1 basis and lower quality hedgerows on a 1:1 basis. The long term management of existing lower quality hedges will compensate for the incorporation of hedges into a urbanised setting and additional hedgerow planting will increase the overall quantity of high-quality, species rich hedgerows. This will result in a beneficial effect at a local level.

10.11.11 The planting of new trees will result in a beneficial effect at a Site/ local level.

10.11.12 The creation of species-rich grassland, scrub, hedgerow and tree planting and enhancement and long-term management of habitats within the Black Brook corridor will result in a significant beneficial effect at a County level, as discussed above.

10.11.13 Woodland, grassland and scrub habitats will be created within the green infrastructure in the Site. These habitats and the habitats within Garendon Park will be managed in the long-term for nature conservation. This will significantly increase the connectivity of habitats within the Site and the wider environs. Once these habitats are established, they will form a mosaic of habitats that would be likely to qualify as under the LWS selection criteria. These areas are indicated on Figure 10.3. In addition, management through the GIBMP will enhance the quality of existing habitats retained throughout the Site and will secure existing and newly created habitats from degradation in the long-term. These measures will result in a significant beneficial effect at a County level.

Fauna

10.11.14 The loss of foraging habitats for badgers will result in an residual adverse effect at a Site level

10.11.15 The planting of new woodland, species rich pasture and hedgerows and the enhancement of arable land will result in an increase in the overall foraging value of the Site for bats and increase the value of the Site for breeding birds (excluding arable farmland birds), leading to beneficial effects for both species groups at a Local level.

10.11.16 The installation of bat and bird boxes and roost and nest features will increase the number of roosting and nesting opportunities for bats and birds, resulting in beneficial effects for both species groups at a Local level.

10.11.17 The loss of farmland bird habitats will be mitigated by the enhancement of the retained arable land, however, this is likely to result in a residual adverse effect on farmland birds at a Site/local level.

10.11.18 The increased risk of predation by cats is likely to result in an adverse effect on birds at a Site level. However, this will be offset by the overall increase in habitat value within the GI and Garendon Park.

10.11.19 The enhancement of bankside habitats along the Black Brook will result in a beneficial effect for otters at a local level.

10.11.20 The creation of habitats within the green infrastructure and enhancement of habitats within the Garendon Park will result in a beneficial effect for reptiles and other notable species at a Site level.

10.12 Cumulative Effects

10.12.1 The effects of the Development are considered in combination with potential effects arising from the following schemes:

- Loughborough University Science and Enterprise Park ;
- Biffa Waste Incinerator (P/14/0828/2);
- Dishley Grange Employment Site; and
- Ashby Road widening (enabling access to the proposed West of Loughborough Strategic Link Road).

Loughborough University Science and Enterprise Park

10.12.2 According to CBC's emerging Core Strategy, the University Science and Enterprise Park will consist of a 77ha development of research and technology businesses. The scheme will include 40% green space and will be required to be planned to create and improve habitats, reflecting the established character. The existing site consists of arable farmland situated between Holywell and Burleigh Woods and the Longcliffe Golf Course. Given the extent of proposed green-space within the University Science and Enterprise Park, it is likely that any adverse effects on features of nature conservation value can be fully mitigated within the development, with the possible exception of farmland birds. If insufficient mitigation is provided for the loss of habitat for these species, there is potential for the effect to combine with the effects of the West of Loughborough SUE, resulting in an overall significant adverse effect. However, given that the West of Loughborough proposal provides significant measures to minimise the effects on farmland birds, provided that the University Science and Enterprise Park is required to provide appropriate levels of mitigation, the residual combined effect would not be significant.

Biffa Waste Incinerator

10.12.3 The original application for the Biffa Waste Incinerator facility (planning reference 2009/2497/02 was refused on the grounds of impacts on the landscape and setting of Garendon Park, but granted permission at appeal by the Secretary of State. In response to a subsequent EIA screening request in respect of amendments to the proposal, both Leicestershire County Council and Natural England agreed that, notwithstanding the need for surveys to be updated, the assessment provided in the original Environmental Statement in respect of ecology still stands. The ecological assessment in the Environmental Statement concluded that the "*restoration and habitat enhancements outlined […] would compensate in the long-term for the loss of habitat resulting from the proposed construction of the ERF*" and that "*the long-term management of these habitats should ensure that habitats of ecological value are maintained at the Site for the long-term."* It is therefore unlikely that any cumulative effects would arise from this waste incinerator in combination with the Development.

Dishley Grange Employment Site

10.12.4 The Dishley Grange Site adjoins Loughborough's established Bishop Meadow Industrial Park on the northern fringes of the town, with convenient access off a new roundabout junction on the A6(T). The Site is allocated within the CBC's emerging Core Strategy and is planned for B1/B2/B8 industrial, warehouse and office purposes. In 2011, CBC's Plans Committee approved outline planning permission (P/08/2048/2) on the Dishley Grange Site. This application identified that ecological resources associated with the Site are limited and any adverse effects could be fully mitigated. It is therefore unlikely that any cumulative effects would arise from this Dishley Grange employment site in combination with the Development.

Ashby Road Widening

10.12.5 The proposed widening of Ashby Road has potential to result in loss or disturbance of up to around 500m of hedgerow along the southern boundary of the Site. Implementation of appropriate protection measures and reinstatement of any hedgerow lost or permanently affected would mitigate these effects such that they are unlikely to be significant. Given the extent of hedgerows present within the Site, it is highly unlikely that any effects on hedgerow associated with the proposed widening scheme would be significant in combination with the effects of the Development.

11 AIR QUALITY

11.1 Introduction

11.1.1 This Chapter presents the approach and findings of the Air Quality Environmental Impact Assessment (EIA) and has been prepared by WYG Environment (WYG). The Chapter sets out the methodology followed and provides a review of the baseline air quality in the vicinity of the Site and surrounding area and then presents the results of the assessment of air quality associated with the Development in order to determine the anticipated magnitude and significance of effect. Mitigation measures are presented and discussed to minimise the air quality effects associated with the proposals during the construction and operational phases of the Development.

11.1.2 The areas incorporated within this assessment are the surrounding highway network of the Development.

11.2 Methodology and Scope

11.2.1 Further to the planning policy presented in Chapter 4 of this ES, specific details with regard to the consideration of air quality are detailed below.

11.2.2 The National Planning Policy Framework (NPPF) principally brings together and summarises the suite of now cancelled Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The NPPF broadly retains the principles of cancelled PPS 23: Planning and Pollution Control and states that:

11.2.3 '*Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.'*

11.2.4 The National Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. A review of the PPG identified the following guidance:

'When deciding whether air quality is relevant to a planning application, local planning authorities should consider whether the development would:

Significantly affect traffic in the immediate vicinity of the Development site or further afield. This could be by generating or increasing traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; adds to turnover in a large car park; or result in construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more.

Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; or extraction systems (including chimneys) which require approval

under pollution control legislation or biomass boilers or biomass-fuelled CHP plant; centralised boilers or CHP plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area.

Expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality.

Give rise to potentially significant impact (such as dust) during construction for nearby sensitive locations.'

Charnwood Borough Council Local Plan

11.2.5 The Charnwood Borough Council (CBC) Local Development Plan (LDP) was adopted on 12 January 2004, and outlined the Council's broad planning strategy for the Borough. The LDP contains 'saved' development plan policies under the terms of the 2004 Act. The saved policies of the LDP are in the process of being replaced by CBC's emerging Core Strategy in line with the Planning and Compulsory Purchases Act (2004). At present, the emerging Core Strategy is at Examination, therefore the saved policies within the 2004 Local Plan have been considered for the purpose of this assessment.

11.2.6 Following a review of these 'saved' policies, the following has been identified as being relevant to the development proposals from an air quality perspective:

"Development and Pollution: Policy EV/39.

Planning permission will not be granted for new development which:

i) Because of its nature or operation, would be likely to result in a serious risk to the health or general amenities of nearby residents, the public generally or the natural environment; or,

ii) Involves residential or other development sensitive to pollution which would be likely to suffer poor environmental amenity due to excessive noise, disturbance, dust, smoke or other polluting effects arising from existing development nearby.

Planning permission will only be granted in these instances where appropriate measures to overcome the potential pollution problems are proposed and implemented to the satisfaction of the local planning authority."

European Legislation

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

- Directive 1999/30/EC – the First Air Quality "Daughter" Directive – sets ambient air limit values for nitrogen dioxide (NO2) and oxides of nitrogen (NOX), sulphur dioxide (SO2), lead (Pb) and particulate matter (PM);
- Directive 2000/69/EC – the Second Air Quality "Daughter" Directive – sets ambient air limit values for benzene (C6H6) and carbon monoxide (CO); and

- Directive 2002/3/EC – the Third Air Quality "Daughter" Directive – seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone (O3) in ambient air.

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

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

UK Legislation

11.2.9 The Air Quality Standards Regulations (2010) seek to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directive, First, Second and Third Daughter Directives and also transpose the Fourth Daughter Directive within the United Kingdom (UK). The Air Quality Limit Values are transposed into the updated Regulations as Air Quality Standards, with attainment dates in line with the European Directives. SI 2007 No. 64 Regulation 14 extends powers, under Section 85(5) of the Environment Act (1995), for the Secretary of State to give directions to Local Authorities (LAs) for the implementation of these Directives.

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

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

11.2.12 The AQOs for pollutants included within the Air Quality Strategy are presented in Table 11.1 along with European Commission (EC) Directive Limits and World Health Organisation (WHO) Guidelines.

Table 11.1 Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Applies	Objective	Concentration Measured as[10]	Date to be achieved and maintained thereafter	European Obligations	Date to be achieved and maintained thereafter	New or existing
PM_{10}	UK	50µg/m^3 by end of 2004 (max 35 exceedances a year)	24-hour mean	1st January 2005	50µg/m^3 by end of 2004 (max 35 exceedances a year)	1st January 2005	Retain Existing
	UK	40µg/m^3 by end of 2004	Annual mean	1st January 2005	40µg/m^3	1st January 2005	

Pollutant	Applies	Objective	Concentration Measured as[10]	Date to be achieved and maintained thereafter	European Obligations	Date to be achieved and maintained thereafter	New or existing
Nitrogen Dioxide (NO_2)	UK	200µg/m^3 not to be exceeded more than 18 times a year	1 Hour Mean	31st December 2005	200µg/m^3 not to be exceeded more than 18 times a year	1st January 2010	Retain Existing
	UK	40µg/m^3	Annual Mean	31st December 2005	40µg/m^3	1st January 2010	

11.2.13 Within the context of this assessment, the annual mean objectives are those against which residential receptors will be assessed and the short term objectives apply to all receptor locations, both residential and non-residential.

11.2.14 Local Air Quality Management Technical Guidance TG(09) paragraph 2.31 states that:

"Previous research carried out on behalf of Defra and the devolved administrations identified a relationship between the annual mean and the 1-hour mean objective, such that exceedances of the latter were considered unlikely where the annual mean was below 60µg/m^3."

11.2.15 Therefore, for the purposes of this assessment, the 1 hour mean objective for nitrogen dioxide (NO_2) is assumed to be met at receptor locations if the annual mean is Local Authority determined to be less than 60µg/m^3.

Local Authority Pollution Control

11.2.16 Local Authorities (LAs), including Charnwood Borough Council (CBC), have formal powers to control air quality through a combination of Environmental Permitting, Local Air Quality Management (LAQM) and by use of their wider planning policies.

11.2.17 The following subsections provide details of CBC's air quality obligations applicable to this assessment.

Local Air Quality Management

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

Dust Management

11.2.19 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2007) and subsequent amendments, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

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

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

Assessment Methodology

Predicting the Magnitude of Likely Air Quality Significant Effects

11.2.21 Table 11.2 provides the criteria used for the classification of the magnitude of likely significant air quality effects.

Table 11.2 Method for Assessing Magnitude of Likely Significant Effects on Air Quality

Magnitude[(1)]	Description	Examples
Large	Likely significant effect resulting in a considerable change in environmental conditions with severe undesirable/desirable consequences on the receiving environment, as a result of the development.	• Variation in predicted concentration of more than 10% of the air quality criterion. (Operation) • Large risk that emissions will generate statutory nuisance complaints, resulting in formal action. (Construction) • Area affected is less than 10m from an active construction site.
Medium	Likely significant effect resulting in a discernible change in environmental conditions with undesirable/desirable conditions or possibly causing statutory objectives to be exceeded, as a result of the development.	• Variation in predicted concentration of 5-10% of the air quality criterion. (Operation) • Medium risk that emissions will generate statutory nuisance complaints, resulting in formal action. (Construction) • Area affected is within 100m of a major active construction site.
Small	Likely significant effect resulting in a discernible change in environmental conditions with undesirable/desirable conditions that can be tolerated, as a result of the development.	• Variation in predicted concentration of 1-5% of the air quality criterion. (Operation) • Small risk that emissions will generate statutory nuisance complaints, resulting in formal action. (Construction) • Area affected is between 100m and 1,000m of a major active construction site or up to 100m from a minor active construction site, a demolition site or compound.

Magnitude[1]	Description	Examples
Imperceptible [2]	No discernible change in environmental condition, as a result of the development.	• Variation in predicted concentration of less than 1 of the air quality criterion (Operation) • Little or no cause for nuisance complaints to be made. (Construction) • Area affected is greater than 100m from any minor construction activity or 1000m from any major construction activity

NOTE (1) A likely significant effect's magnitude can be either positive or negative, except for negligible.
(2) If the assessor is certain that a receptor or attribute of a feature will suffer no likely significant effect whatsoever then the term 'No Likely significant effect' can be used in the place of 'Negligible Likely significant effect'. However, it is not usually possible to determine 'No Likely significant effect' in many cases with 100% certainty so the term 'Negligible' should be used in these cases.

11.2.22 It is recognised that likely significant air quality effects can operate over a range of geographical areas and therefore a geographical scale may be taken into account in describing the scale/magnitude of the likely significant effect.

Receptor Sensitivity

11.2.23 Receptors can demonstrate different sensitivities to changes in their environment. For the purpose of this assessment sensitivity is determined as Very High, High, Medium or Low as detailed in Table 11.3.

Table 11.3 Methodology for Assessing Sensitivity of Receptor: Air Quality

Sensitivity	Criteria
Very High	• Do Minimum pollutant concentration already exceeding the relevant AQO (Emissions). • Receptors of very high sensitivity to dust and odour, such as: hospitals and clinics, retirement homes, painting and furnishing, hi-tech industries and food processing (Construction). • Densely populated areas – more than 100 dwellings within 20m of the development site (Construction)
High	• Do Minimum pollutant concentration already 90 - 100% of the relevant AQO (Emissions). • Receptors of high sensitivity to dust and odour, such as: schools, residential areas, food retailers, glasshouses and nurseries, horticultural land and offices (Construction). • Densely populated areas – 10-100 dwellings within 20m of the development site (Construction).
Medium	• Do Minimum pollutant concentration between 75-90% of the relevant AQO (Emissions). • Receptors of medium sensitivity to dust and odour, such as: farms, outdoor storage, light and heavy industry (Construction). • Suburban or edge of Town areas (Construction).
Low	• Do Minimum pollutant concentration less than 75% of the relevant AQO (Emissions). • All other dust/odour sensitive receptors not identified above (Construction). • Rural/Industrial areas (Construction).

Significance of Effects

11.2.24 The level of significance of each likely effect is determined by combining the likely significant effect risk with the sensitivity of the receptor. Table 11.4 shows how the interaction of magnitude and sensitivity results in the significance of an environmental effect. If the scale of the likely significant effect magnitude is negative then the resulting effect is adverse. If the scale of the likely significant effect magnitude is positive then the resulting effect is beneficial. The table has been developed by WYG but the matrix combinations and terms used correlate with the significance matrix recommended by Development Control: Planning for Air Quality (2010 Update) Updated guidance from Environmental Protection UK on dealing with air quality concerns within the development control process (April 2010).

Table 11.4 Effect Significance Matrix

Sensitivity of Receptor	Magnitude of Impact			
	Large	**Medium**	**Small**	**Imperceptible**
Very High	Substantial	Moderate	Slight	Negligible
High	Moderate	Moderate	Slight	Negligible
Medium	Slight	Slight	Negligible	Negligible
Low	Slight	Negligible	Negligible	Negligible

Limitations of the Assessment

Background Data

11.2.25 Mapped background pollutant concentrations are available from Department for Environment Food and Rural Affairs (DEFRA) website.

11.2.26 The predicted background concentrations in the Archive decrease year on year based on the predicted progressive positive influence of EU and UK air quality legislation. The Defra Local Air Quality Management Note on Projecting NO_2 concentrations (April 2012) states that:

"Emissions especially those from some diesel vehicles and older petrol cars, are not thought to be reducing as expected. Moreover, it is still unclear if Euro VI standards will deliver the expected reductions in emissions as they become increasingly prevalent within the vehicle fleet post 2015."

11.2.27 The assessment has therefore assumed that there will be no improvement in background air quality. In consideration of the methodology for adjusting background concentrations as contained within the Defra LAQM Note on Projecting NO_2 concentrations (April 2012) guidance, no adjustment of background data were carried out, allowing for a robust approach. As such, 2010 concentrations have been used throughout the operational phase assessment. Details of background concentrations used for the operational phase assessment are presented in the Supporting Air Quality Technical Report (SAQTR) at Appendix 11.1.

11.2.28 It should be noted that the background concentrations used in the assessment will not affect the predicted marginal increase in pollutant concentrations as a result of the development which the assessment is based upon.

Traffic Data

11.2.29 The Traffic and Transport data has been based on a complete build out of the scheme in the year 2021 as this is the worst case in terms of the traffic impact on the highway network. However, it is likely that there will be a time where construction and residents are present on the Site at the same time. It is not possible to predict the occupancy of the Development as this is based on numerous variables such as market conditions and phasing. Therefore no analysis of the dual construction occupation of the site has been undertaken.

Emission Factors

11.2.30 The Emission Factor Toolkit (version 5.2c) (January 2013) for road traffic emission factors, was utilised to predict emission rates for the operational phase assessment.

11.3 Baseline Environment

11.3.1 Baseline air quality in the vicinity of the Site has been defined from a number of sources, as described in the following sections

Air Quality Review and Assessment

11.3.2 As required under section 82 of the Environment Act 1995, CBC has conducted an ongoing exercise to review and assess air quality within its area of jurisdiction. The assessments have indicated that concentrations of both NO_2 and PM_{10} are above the relevant AQOs at locations of relevant public exposure. CBC has therefore designated four Air Quality Management Areas (AQMAs), which are described as:

- Loughborough AQMA: Residential properties along the main arterial routes through Loughborough;
- Great Central Railway AQMA: an area encompassing a number of properties in the vicinity of the Great Central Railway locomotive engineering shed in Loughborough;
- Syston AQMA: Residential properties along the main road through Syston; and,
- Mountsorrel AQMA: An area surrounding the Mountsorrel Quarry.

11.3.3 The boundary of the Site is located approximately 700m to the west of the Loughborough AQMA. Due to the proximity of the AQMA, it has been considered throughout the assessment.

Air Quality Monitoring

11.3.4 The UK Automatic Urban and Rural Network (AURN) is a country-wide network of air quality monitoring stations operated on behalf of the Department for the Environment Food and Rural Affairs (DEFRA). Monitoring data for AURN sites is available from the UK National Air Quality Archive. Given that none of the AURN monitoring locations lie within the extents of the main study area, these monitoring locations have not been considered further within this assessment.

Continuous Monitoring

11.3.5 CBC currently operates four continuous air quality monitoring stations as part of their commitment to LAQM. A summary of the CBC continuous analyser NO_2 monitoring results is provided in Table 11.5.

Table 11.5 Continuous Monitoring Data 2012

ID	Location	Located within an AQMA	Site Type	2012 Annual Mean NO_2 Concentration (µg/m^3)
11	Durham Road, Loughborough	N	Urban Background	24.8
38	Baxter Gate, Loughborough	Y	Roadside	76.4(1)
35	Melton Road, Syston	Y	Roadside	30.6

NOTE (1) The last 307 hourly readings were erroneous and should be discarded.

11.3.6 As indicated in Table 11.5 the annual mean NO_2 AQO of 40µg/m^3 was exceeded in 2012 at one monitoring location, Baxter Gate. The closest continuous monitoring sites to the Development are located on Durham Road and Baxter Gate. These lie 1.5km and 3km to the east of the site, respectively. As such, given the proximity of these automatic stations to the Site, they are considered representative of air quality conditions within the study area.

Non Continuous Monitoring

11.3.7 CBC operates a network of diffusion tubes. NO_2 concentrations were monitored at 38 locations in 2012. The closest NO_2 diffusion tube monitoring results are presented in Table 11.6 below.

Table 11.6 Nitrogen Dioxide Monitoring Locations

ID	UK NRG(m)		Location	Site Classification	Within AQMA?	2012
	X	Y				
5	452314.0	319620.0	Haydon Road	Roadside	Y	29.0
6	452173.0	319924.0	Alan Moss Road/Epinal Way	Roadside	Y	27.1
11	452352.0	320697.0	Durham Road	Urban Background	N	23.6
16	448876.0	318307.0	Cow Hill Lodge (Shepshed)	Roadside	N	29.2
26	448121.0	318257.0	Ashby Road Central (Shepshed)	Roadside	N	29.5
27	450260.0	321922.0	Loughborough Road (Hathern)	Roadside	N	26.7

11.3.8 As Table 11.6 illustrates, the nitrogen dioxide diffusion tube monitoring sites did not exceed the National Air Quality Objective of 40µg/m^3 in 2012. Due to the proximity to the site, these monitoring locations have been used in the verification process.

Emission Sources

11.3.9 A desktop assessment has identified that traffic movements are likely to be the most significant local source of pollutants affecting the Site and its surroundings. The principal traffic derived pollutants likely to impact local receptors are nitrogen dioxide and particulate matter.

11.3.10 The assessment has therefore modelled all roads within the immediate vicinity of the Development Site which are considered likely to experience significant changes in traffic flow as a result of the Development. Full details of the traffic data input into the ADMS Roads 3 model can be found in Figure 11.1 providing a visual illustration of the modelled road sources.

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

Meteorology

11.3.12 Meteorological conditions have significant influence over air pollutant concentrations and dispersion. Pollutant levels can vary significantly from hour to hour as well as day to day, thus any air quality predictions need to be based on detailed meteorological data. The ADMS model calculates the dispersion of pollutants on an hourly basis using a year of local meteorological data. The meteorological data used in the assessment is derived from East Midlands Airport Meteorological Station. This is the nearest meteorological station which is considered representative of the Site, with all the complete parameters necessary for the ADMS model. Reference should be made to Figure 11.2 for an illustration of the prevalent wind conditions at the East Midlands Airport Meteorological Station site.

Sensitive Receptors

11.3.13 The term 'sensitive receptors' includes any persons, locations or systems that may be susceptible to changes in abiotic factors as a consequence of the Development. These have been identified in the following sections.

Ecological Sensitive Receptors

11.3.14 Likely significant air quality effects associated with both the construction and operation of the Development have the potential to effect receptors of ecological sensitivity within the vicinity of the Site. The Conservation of Habitats and Species Regulations (2010) require competent authorities to review planning applications and consents that have the potential to have likely significant effect on European designated sites (e.g. Special Areas of Conservation).

11.3.15 A desktop assessment of ‘Designated’ ecological receptors (as defined within the Design Manual for Roads and Bridges Guidance on Air Quality Assessments) has been undertaken as well as a review of other potentially sensitive ecological receptors such as Local Nature Reserves (LNR) and Ancient Woodland. Following a search within a 2km radius of the Site boundary, the following sites were identified:

- Oakley Wood – Site of Special Scientific Interest (SSSI) approximately 150m to the north-west of the Site;
- Bishop’s Meadow – Local Nature Reserve approximately 1.7km to the north-east of the Site;
- Newhurst Quarry – SSSI 700m to the south west;
- Morley Quarry – Local Nature Reserve 1.6km to the south-west;
- Ives Head – SSSI 2km to the south-west; and,
- Beacon Hill, Hangingstone and Out Woods – SSSI approximately 1.5km to the south-east.

11.3.16 Reference should be made to the Ecology Chapter 10 for a full description of each designation.

11.3.17 Based on the mitigation measures within the submitted design during the construction phase, the Development is not expected to result in any significant impacts at the locally designated ecological locations during construction. Additional modelling has been undertaken which considers the critical load (CL) of Nitrogen (N) on the designated ecological receptor locations during the operational phase of the Development.

11.3.18 Ecological receptor locations were modelled in close proximity to road links within the assessment area. These locations are detailed in Table 11.7.

Table 11. 7 Modelled Ecological Receptor Locations

Discrete Sensitive Receptor		UK NGR (m)	
		X	Y
ER1	Oakley Wood*	448660.9	321140.1
ER2	Newhurst Quarry*	448702.4	318041.6
ER3	Bishop's Meadow*	452596.5	321760.2

Exhaust Emission Sensitive Receptors

11.3.19 The Design Manual for Roads and Bridges (DMRB) considers any receptor within 200m of a road source to be potentially affected by that operation. The AQOs only apply at locations where the public may be exposed to pollution for a sufficient period for there to be any measurable health effect. The averaging period and AQO involved will determine which locations are considered to be sensitive receptors. For annual mean NO_2 and particulate matter with mean hydraulic diameter of less than 10µm (PM_{10}) AQOs, LAQM.TG(09) considers typical locations for sensitive receptors to include:

- Residential properties;
- Hospitals;
- Schools; and,
- Care homes.

11.3.20 Receptors sensitive to road vehicle exhaust emissions are shown in Table 11.8. Reference should be made to Figure 11.1 for a graphical representation of road vehicle exhaust sensitive receptor locations.

Table 11.8 Modelled Sensitive Receptor Locations

Discrete Sensitive Receptor		UK NGR (m)	
		X	Y
R1*	Viking Court (Industrial)*	449991.8	322195.7
R2	67 Loughborough Road	450148.5	321957.2
R3	144 Loughborough Road	450483.4	321770.8
R4	Dishley Cottage	450933.1	321169.4
R5	1 Darwin Crescent	451070.1	321102.6
R6	20 Lyall Close	451633.1	321022.0
R7	11 Roydale Close	452153.0	320799.3
R8	77 Durham Road	452250.7	320734.7
R9	253 Derby Road	452556.3	320655.2
R10	162 Derby Road	452733.4	320424.7
R11	114 Derby Road	452907.3	320216.3
R12	60 Regent Court	453172.9	320053.0
R13*	11 Swan Street*	453523.6	319729.7
R14	Ashby Square Student Accommodation	453458.1	319712.1

Discrete Sensitive Receptor		UK NGR (m)	
		X	Y
R15	108 Ashby Road	453112.3	319701.5
R16	162 Ashby Road	452940.4	319680.8
R17	137 Ashby Road	452726.4	319700.6
R18	216 Ashby Road	452391.6	319497.0
R19	219 Ashby Road	452369.9	319539.6
R20	Loughborough Hospital*	452279.8	319725.7
R21	156 Alan Moss Road	452172.0	319924.5
R22	123 Alan Moss Road	452146.0	319962.5
R23	116 Alan Moss Road	452342.4	319997.5
R24	66 Alan Moss Road	452559.7	320063.7
R25*	120 Derby Road* (Commercial)	452882.4	320241.3
R26	19 Copeland Crescent	451857.9	320311.5
R27	25-32 Warwick Court	451814.9	320383.0
R28	5 Warwick Court	451873.8	320460.4
R29	1 Milton Court	451991.9	320535.2
R30	54 Warwick Way	452088.6	320602.3
R31	1 Cotswold Close	452021.3	319415.4
R32	Margaret Keay Road Student Accommodation	451725.1	319157.1
R33	301 New Ashby Road	451822.9	319329.9
R34	379 New Ashby Road	451565.9	319109.3
R35	421 New Ashby Road	451379.2	318920.6
R36	509 New Ashby Road	451061.7	318671.7
R37*	Loughborough University*	451378.6	318749.7
R38	1-6 New Ashby Court	450827.7	318594.9
R39	54 Abberton Way	450213.0	318505.3
R40*	Ashby Road East, Offices*	448638.9	318253.5
R41	16 Ashby Road Central	448100.3	318247.7
R42	38 Ashby Road Central	447995.3	318243.2
R43	2 Crowson Close	447604.7	318257.2
R44	Mill Farm	448628.4	320741.9
R45	Oakley Wood Cottage	448761.5	321203.4
R46	5 Shepshed Road	449945.1	322231.9
R47	56 Shepshed Road	449766.5	322099.6

Note: *Non-Residential receptors are marked with asterisk.

11.3.21 The sensitive receptors identified in Table 11.8 represent worst-case locations and have been chosen as the closest residences to each road which may be affected by the traffic associated with the Development. However, this is not an exhaustive list and there may be other locations within the vicinity of the Site that may experience air quality effects as a result of the Development that have not been individually identified above.

11.3.22 Vehicle exhaust emissions at each identified discrete receptor have been quantified using ADMS-Roads software package developed by Cambridge Environmental Research Consultants (CERC). This model is routinely used for environmental assessment work throughout the UK.

11.3.23 Reference should be made to the SAQTR for full details of the modelling results used to define the sensitivity of receptors in accordance with the stated assessment methodology.

Future Baseline

11.3.24 In terms of road traffic growth the ‘do-minimum’ scenario includes predicted traffic data should the development not occur, including all committed developments. This ensures that the growth in future baseline traffic flows is taken, to take into account changes in traffic in the baseline.

11.3.25 The air quality dispersion model assumes no improvement in background NO_2 concentrations as such it is considered to be a robust approach.

11.3.26 The future baseline of the Site will change as the Development phasing progresses. Therefore new residential receptors will be present within the future baseline as the Development proceeds to completion. The mitigation strategy proposed accounts for this evolving future baseline to ensure these are then taken into account at reserved matters application stages.

11.4 Mitigation within the Submitted Design

Construction

11.4.1 The following measures will be adopted as part of an approved Construction Environmental Management Plan (CEMP).

Site Planning

- No bonfires.
- Plan Site layout – machinery and dust causing activities should be located away from sensitive receptors.
- All Site personnel to be fully trained.
- Trained and responsible manager on site during working times to maintain logbook and carry out site inspections.
- Hard surface Site haul routes.

Construction traffic

- All vehicles to switch off engines – no idling vehicles.
- Effective vehicle cleaning and specific fixed wheel washing on leaving site and damping down of haul routes.
- All loads entering and leaving Site to be covered.
- No Site runoff of water or mud.
- On-road vehicles to comply to set emission standards.
- All non-road mobile machinery (NRMM) to use ultra-low sulphur tax-exempt diesel (ULSD) where available and be fitted with appropriate exhaust after-treatment from the approved list.
- Minimise movement of construction traffic around Site.
- Hard surfacing and effective cleaning of haul routes and appropriate speed limit around site.

Demolition

- Cutting equipment to use water as suppressant or suitable local extract ventilation.
- Use water as a dust suppressant, using water efficient measures.

- Use enclosed chutes and covered skips.
- Wrap building(s) to be demolished

Site Activities

- Minimise dust generating activities.
- Use water as dust suppressant where applicable.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Re-vegetate earthworks and exposed areas.
- If applicable, ensure concrete crusher or concrete batcher has permit to operate.

Operation

11.4.2 The following mitigation measures aim to increase the number of residents travelling to and from the Site on foot, by cycle and/or by public transport. As such the number of trips to and from the site made by private car, and especially the single occupancy private car, will be reduced. The following measures are considered best practice but should not be regarded as an exhaustive list of potential mitigation options:

- Minimise reliance upon motor vehicle use through a Framework Travel Plan;
- Promote alternative transport options;
- Inclusion of integrated cycle paths into surrounding environments; and,
- Inclusion of pedestrian walkways into surrounding environments.

11.5 Likely Significant Environmental Effects of the Scheme

Likely Significant Construction Effects of the Scheme

11.5.1 Outline construction proposals are described in earlier Chapters of this ES. Although no specific detailed information on the scope or methodology of construction phase works is available at this stage, it is reasonable to assume that activities will include:

- Remediation and earthworks on-site including excavations and some localised re-grading;
- Material import and export;
- Temporary stockpiling of materials;
- Construction of new on-site facilities such as services, roads, superstructures and external areas; and,
- Associated vehicle movements with the above.

11.5.2 Likely significant air quality effects associated with these activities have been identified as:

- Generation of dust emissions on-site during demolition works, earthworks, and as a result of windblown debris and construction materials;
- Generation of exhaust emissions from construction plant on Site; and,

- Generation of exhaust emissions from construction phase road traffic, including Light Duty Vehicles (LDVs) carrying construction workers to and from the development site and Heavy Duty Vehicle (HDV) movements involved with the export and import of construction material.

Particulate Matter (PM10)

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

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

Dust

11.5.5 Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. There are no formal standards or criteria for nuisance caused by deposited particles, however, a deposition rate of 200mg/m^2/day is often presented as a threshold for serious nuisance though this is usually only applied to long term exposure as people are generally more tolerant of dust for a short or defined period. Significant nuisance is likely when the dust coverage of surfaces is visible in contrast with adjacent clean areas, especially when it happens regularly. Severe dust nuisance occurs when the dust is perceptible without a clean reference surface.

11.5.6 Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the Site. Measures should be taken to minimise the emissions of dust as part of good site practice. Recommended mitigation measures proportionate to the risk associated with the Development and based on best practice guidance are discussed in earlier in this Chapter.

Methodology

11.5.7 WYG have adapted Guidance from the IAQM 'Guidance on the Assessment of the likely significant effects of Construction on Air Quality and the Determination of their Significance' document published in January 2012. Whilst the sensitivity of receptors is determined using the criteria contained in Table 11.3, in order to determine the significance of effects the construction phase assessment utilises a risk based approach, rather than defining the magnitude of change, as applied in the operational phase assessment.

11.5.8 In total four processes are considered, namely demolition, earthworks, construction and trackout. For each of these phases, the significance of the potential significant dust effects is derived following the determination of a dust emission class and the distance of activities to the nearest sensitive receptor, therefore assessing worst case likely significant effects. A full explanation of the methodology is contained within the SAQTR at Appendix 11.1.

Assessment Results

11.5.9 Based on the methodology detailed in the SAQTR and prior to the implementation of appropriate mitigation measures, the potential effect significance of dust emissions associated with the

construction phase of the Development is presented in Table 11.9 below. The assessment is based on the nearest sensitive receptors to each source activity.

11.5.10 All effects presented within Table 11.9 are predicted with regard to the potential for dust nuisance complaints and surface soiling events due to deposition, as opposed to the risk of exceeding any AQOs. All dust effects are considered to be direct, temporary, short-term and reversible in nature. The effects are determined to be direct as they occur as a result of activities associated with the Development, temporary as they will only potentially occur during the construction phase, short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine, and reversible as conditions will return to baseline upon cessation of construction phase activities. The effects arising from earthworks in terms of dust soiling and PM_{10} are significant in EIA terms; all other effects are not significant.

11.5.11 As the assessment of potential dust effects has been undertaken qualitatively based on the construction scenario set out in earlier Chapters, confidence in these predictions is low.

11.5.12 It should be noted that all effects have been assessed based on the distance between the planning application boundary and the receptor location. The majority of dust generating activities are unlikely to be undertaken at the Development boundary and therefore the distance to the sensitive area would usually be greater than those used in the assessment. Predicted effects are therefore based on a worst-case scenario.

Table 11.9 Effect Significance of Construction Activities with Design Mitigation

Source	Effect Significance		
	Dust Soiling	PM_{10}	Ecological
Demolition	Negligible	Negligible	None
Earthworks	Negligible	Negligible	Negligible
Construction	Negligible	Negligible	Negligible
Trackout	Negligible	Negligible	None

Generation of Exhaust Emissions by Construction Plant On-site

11.5.13 Exhaust emissions from wagons, plant and other construction vehicles involved with works on the proposed Site have the potential to generate emissions to air.

11.5.14 An assumed range of construction plant has been used for the purposes of this assessment and therefore confidence in this assessment is low. However, potential air quality effects will depend on the location of plant in relation to sensitive receptors.

11.5.15 The potential effect of temporary construction plant exhaust emissions has been assessed as being imperceptible in magnitude to receptors of high to low sensitivity, as it is considered unlikely that concentrations of exhaust pollutants would increase by more than 1% of the relevant AQO. The unmitigated effect significance is therefore predicted to be negligible, in accordance with the stated assessment methodology and as such is not considered to be significant.

11.5.16 All effects are considered to be direct, temporary, long-term and reversible in nature. The effects are determined to be direct as they occur as a result of plant on-site associated with the Development, temporary as they will only potentially occur during the construction phase, long-

term because these have the potential to be generated during the entire construction phase, and reversible as conditions will return to baseline upon cessation of construction phase activities.

11.5.17 Although a negligible significance of likely significant effects has been predicted as most likely, suitable mitigation options and best practice techniques, as outlined in section 11.4 will provide the assurance that effects will be controlled.

Generation of Exhaust Emissions by Construction Phase Road Traffic

11.5.18 Road traffic exhaust emissions generated by wagons, vans, cars and other vehicles associated with the Development using the local and regional road network have the potential to cause increased concentrations of traffic-related pollutants, such as NO_2 and PM_{10}, in the vicinity of the Site.

11.5.19 Additional vehicle trips are anticipated to include LDVs carrying employees and visitors to and from the Development and additional heavy duty vehicles HDV movements associated with the import and export of material.

11.5.20 The DMRB states that further assessment of likely significant air quality effects should be undertaken if the following criteria are met on any link affected by the Development:

- Increase in 24-hour Annual Average Daily Traffic (AADT) flow of more than 1,000No. vehicles; and/or,
- Increase in 24-hour AADT HDV flow of more than 200No. vehicles.

11.5.21 The Environmental Protection UK guidance Development Control: Planning for Air Quality states that the need for an air quality assessment of construction phase HDV movements will be required for:

"Large, long-term construction sites that would generate large HGV movements (>200 movements per day) over a period of a year or more."

11.5.22 Detailed information on traffic movements anticipated during construction works is detailed within Chapter 9 of this ES.

11.5.23 A summary of the traffic movements based upon the typical working week are provided within Chapter 9 of this ES. The DMRB screening criteria is not exceeded during the construction of the Development; therefore likely air quality effects are not likely to be significant.

11.5.24 The distribution of traffic flows generated by the construction phase of the Development on the local and regional road network is difficult to predict as it will depend on the source and end locations of the required materials.

11.5.25 The potential effect of construction phase road vehicle exhaust emissions has been assessed as being imperceptible in magnitude to receptors of high to low sensitivity. The effect significance is considered to be negligible, in accordance with the stated assessment methodology and as such is not considered to be significant.

11.5.26 All effects are considered to be direct, temporary, long-term and reversible in nature. The effects are determined to be direct as they occur as a result of off-site vehicle movements associated with the Development, temporary as they will only potentially occur throughout the construction

phase, long-term because these have the potential to arise at any time during the entire construction phase, and reversible as conditions will return to baseline upon cessation of construction phase activities.

11.5.27 As the assessment of potential effects resulting from construction traffic has been undertaken using the DMRB assessment methodology, confidence in this prediction is high.

Likely Significant Operational Effects

11.5.28 Air quality effects associated with the operational phase of the Development have been identified as road vehicle exhaust emissions associated with vehicles travelling to and from the Development.

Road Vehicle Exhaust Emissions

11.5.29 Additional vehicle movements associated with the Development will generate additional exhaust emissions, such as NO_2 and PM_{10}, on the local and regional road networks. In order to quantify potential effects of these emissions in the vicinity of the site, a detailed dispersion modelling assessment has been undertaken using the ADMS-Roads software package. This model is routinely used in the UK for environmental assessment work.

11.5.30 Traffic data for this assessment is described within the SAQTR.

11.5.31 The likely significant effect of road vehicle exhaust emissions has been undertaken with an assumed operational year of 2021. The assessment scenarios are therefore:

- 2021 'Do Minimum' = Baseline + committed development
- 2021 'Do Something' = Baseline + committed development + proposed development

11.5.32 The Development opening years were considered with appropriate 'do-minimum' and 'do-something' scenarios. The 'do-minimum' scenario included predicted traffic data should the Development not occur, including committed development traffic surrounding the Development. The 'do-something' scenario included predicted traffic data should the Development be completed. Reference should be made to the Transport Assessment at Appendix 9.1 for full details of the traffic flow and committed Development considered within each scenario.

11.5.33 Reference should be made to the SAQTR for the:

- Detailed Modelling of Operational Phase Road Vehicle Exhaust Emissions – Method Statement;
- Detailed Modelling of Operational Phase Road Vehicle Exhaust Emissions – Detailed Results Tables.

Nitrogen Dioxide

11.5.34 Predicted annual mean ground level NO_2 concentrations were assessed against the AQO of 40µg/m3. Reference should be made to the SAQTR for detailed results tables of predicted annual mean ground level NO2 concentrations.

11.5.35 As indicated in the SAQTR, the likely significant effect on annual mean NO2 concentration is predicted to be no more than 0.51µg/m3, at 219 Ashby Road (R19).

11.5.36 All effects are considered to be direct, permanent, long-term and irreversible in nature. The effects are determined to be direct as they occur as a result of vehicles travelling to and from the Development, permanent as they will occur throughout the operational phase, long-term because these occur during the entire operational phase, and irreversible as conditions will not return to baseline conditions until cessation of the Development.

11.5.37 Confidence in these predictions is high given that a detailed dispersion modelling assessment has been undertaken using traffic data provided by WYG, and modelling results have been corrected using a factor of 1.7652524, which is considered to be a robust approach.

Particulate Matter

11.5.38 Predicted annual mean ground level PM_{10} concentrations were assessed against the AQO of 40µg/m^3. Reference should be made to the SAQTR for detailed results tables of predicted annual mean ground level PM_{10} concentrations.

11.5.39 As indicated in the SAQTR, the likely significant effect on annual mean PM_{10} concentration is predicted to be no more than 0.12µg/m^3, at 66 Alan Moss Road (R24).

11.5.40 All effects are considered to be direct, permanent, long-term and irreversible in nature. The effects are determined to be direct as they occur as a result of vehicles travelling to and from the Development, permanent as they will occur throughout the operational phase, long-term because these occur during the entire operational phase, and irreversible as conditions will not return to baseline conditions until cessation of the development.

11.5.41 Confidence in these predictions is high given that a detailed dispersion modelling assessment has been undertaken using traffic data provided by WYG, and modelling results have been corrected using a factor of 1.7652524, which is considered to be a robust approach.

Nitrogen Deposition

11.5.42 Additional modelling has been undertaken which considers the critical load (CL) of nitrogen (N) on the designated ecological receptor locations.

11.5.43 Nitrogen deposition has been calculated adjacent to the road corridor in order to assess the relative change in conditions due to the Development and the total N deposition rate at the modelled ecological receptor points.

11.5.44 As indicated in the SAQTR, the predicted N deposition exceeds the critical load both with and without the Development. The relative change in nitrogen deposition rates as a result of the Development is predicted to be less than 1% of the lower critical load of 10 kg N/ha/yr at all of the modelled receptor locations. the impact of the Development on nitrogen deposition at Oakley Wood, the most sensitive receptor is considered to be negligible.

<u>Likely Significant Cumulative Effects</u>

Construction

11.5.45 It should be noted that due to the distance of other committed developments from the Site the potential for cumulative construction phase effects of dust generation and exhaust emissions from plant on-site are not predicted to be significant.

Operation

11.5.46 Cumulative effects during the operational phase of the Development have been considered within the detailed assessment of vehicle exhaust emissions. The 'do-minimum' scenario included predicted traffic should the Development not occur including all committed developments and the 'do-something' scenarios included predicted traffic should the development be complete. The magnitude of change allows the effect of the Development to be assessed. As the absolute concentration is compared against the AQO the cumulative likely significant effect of the Development is also considered within the assessment.

11.6 Additional Mitigation, Compensation and Enhancement Measures

Construction

11.6.1 The construction phase assessment results in a 'Medium risk' assessment rating for the Site in advance of mitigation, based upon the methodology presented in the SAQTR at Appendix 11.1. Mitigation measures detailed in section 11.4 of this Chapter are recommended to be adopted and should become part of the approved Construction Environmental Management Plan (CEMP). Therefore, no additional mitigation is proposed.

Operation

11.6.2 Implementing traffic management measures through a Travel Plan could result in fewer vehicle trips emanating from the Site and therefore a reduction in associated vehicle emissions. This would result in reductions of the mean roadside concentrations of traffic-related pollutant concentrations.

11.6.3 The following mitigation measures aim to encourage residents travelling to and from the Site on foot, by cycle and/or by public transport. As such the number of trips to and from the Site made by private car, and especially the single occupancy private car, could be reduced. The following measures are considered good practice but should not be regarded as an exhaustive list of potential mitigation options:

- On arrival provide new residents with a Welcome Pack informing them of the sustainable travel options available.
- Promote alternative transport options;
- Procure a new bus service through the Site;
- Inclusion of integrated cycle paths into surrounding environments; and,
- Inclusion of pedestrian walkways into surrounding environments.

11.6.4 Further details of the traffic and transport mitigation measures are included in the supporting Travel Plan as discussed in Chapter 9 of this ES.

11.7 Assessment Summary and Likely Significant Residual Environmental Effects

11.7.1 Table 11.10 provides the summary of the assessment of Air Quality.

Table 11.10 Assessment Summary and Residual Environmental Effects (Air Quality)

Summary description of identified likely significant effect	Sensitivity of Receptor	Magnitude of Likely Significant Effect	Significance and Nature of Effect	Additional Mitigation	Residual Likely Significant Effect Magnitude	Residual Significance and Nature of Effect	Confidence Level
Construction	High to Low	Medium risk	Negligible	No Additional Mitigation is recommended	Medium risk	Negligible	Low
Impact of NO_2 emission generated by road vehicle movements	Low to Medium	Imperceptible to small	Negligible	See section 11.6	Imperceptible to small	Negligible	High
Impact of PM_{10} emission generated by road vehicle movements	Low	Imperceptible	Negligible	See section 11.6	Imperceptible	Negligible	High

11.8 References

The Air Quality Standards Regulations, 2010

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007

The Environment Act, 1995

National Planning Practice Guidance, Draft 2013

Local Air Quality Management Technical Guidance LAQM.TG(09), DEFRA, 2009

Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, HA 207/07 - Air Quality, Highways Agency, 2007

Development Control: Planning for Air Quality, National Society for Clean Air and Environmental Protection, 2010

The Control of Dust and Emissions from Construction and Demolition – Best Practice Guide, Greater London Authority and London Councils, 2006

Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance, Institute of Air Quality Management, January 2012

Defra Local Air Quality Management Note on Projecting NO_2 concentrations (April 2012)

2013 Air Quality Progress Report for Charnwood Borough Council

The Borough of Charnwood Local Plan

12 NOISE AND VIBRATION

12.1 Introduction

12.1.1 This Chapter of the ES has been prepared by WYG Environment (WYG) and considers the effects of the Development on the noise at and within the vicinity of the Site during the construction and operational phases.

12.1.2 The Chapter sets out the methodology followed in undertaking the assessment and provides a review of the baseline features and resources of the Site and surrounding area. A separate technical appendix to this Chapter is found at Appendix 12.1. This includes an additional assessment that has been undertaken for the Site considering proposed (i.e. future residents) receptors with the findings of the assessment summarised to present the significance of the proposals. Within this Chapter an assessment of the construction phase and road traffic noise has been undertaken.

12.1.3 The effects of road traffic noise attributable to the Development on baseline sensitive receptors in order to determine the magnitude of impact and significance of effects are presented. Given the stage of the proposals, for the construction phase, establishing the effect of the Development has been undertaken based on the professional judgement of the assessor. For the purpose of this ES, the effects of such elements have been established based on whether adopted criteria are exceeded or not with the results presented in this Chapter.

12.1.4 Where relevant, mitigation measures are proposed to minimise the impacts of the Development during both the construction and operational phases of the scheme. The expected residual effects of the proposals are then stated.

12.2 Study Area

12.2.1 The extent of the study area for the Site is comparable to that assessed within the Transport Assessment, included at Appendix 9.1. With regard to the impact of noise sources on proposed residential receptors, the assessment is based on the overall study area although, in reality, only localised noise sources will have an influence on the assessment.

12.3 Methodology and Scope

Policy Background

12.3.1 The National Planning Policy Framework specifies in Section 123 that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;

- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their businesses should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained undisturbed by noise and are prized for their recreational amenity value for this reason.

12.3.2 The Explanatory Note to the Noise Policy Statement for England (Department for the Environment, Food and Rural Affairs) provides further detail with regard to establishing broad parameters to defining significant adverse impacts. However, specific noise measures such as limits or thresholds are not presented and it states that:

> *"It is not possible to have a single objective based measure that defines 'significant effect levels' that is applicable to all sources of noise in all situations. As such there remains the requirement to establish relevant criteria based on currently available guidance documents and standards such as the WHO Guidelines and DMRB."*

12.3.3 With respect to Government policy for noise, the national Planning Practice Guidance (PPG) provides the following summary (Table 12.1) of the effects of noise exposure that gives more definition to the terms used in the Noise Policy Statement for England (and NPPF). These definitions help to confirm that the change in noise levels in the magnitude of impact table (table 12.3) and noise levels based on World Health Organisation and BS8233 levels used in the technical report remain appropriate.

Table 12.1 Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No Specific Measures Required
Noticeable and intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			

Perception	Examples of Outcomes	Increasing Effect Level	Action
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular 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	Unacceptable Observed Adverse Effect	Prevent

Key Legislation

12.3.4 The Noise Insulation Regulations (Amended 1988) provide criteria for assessing the eligibility for noise mitigation or properties based on variations in traffic noise due to a new or improved road scheme. Noise level criteria are given within the Regulations which, if satisfied, indicate whether properties in the vicinity may be entitled to the installation of additional noise insulation or to a grant to cover the cost of the noise insulation.

12.3.5 The entitlement conditions of the Noise Insulation Regulations are triggered when:

- "the LA10 (18 hour) predicted figure is greater by at least 1 dB than the prevailing noise level"
- "the LA10 (18 hour) predicted figure is not less than the specified level (LA10 (18 hour) = 68 dB)"
- "the noise caused, or expected to be caused, by traffic using or expected to use the new highway makes an effective contribution to the LA10 (18 hour) predicted figure of at least 1 dB."

Scoping Assessment Stage

12.3.6 The Scoping statement concluded that the principle sources of noise would be road traffic along the M1, A512(T) and the A6(T) and predicted that some mitigation in the form of alternative ventilation (trickle vents) and enhanced glazing would be required where dwelling come within close proximity to the M1 and the A6(T). WYG entered into communication with Environmental

Health for Charnwood Borough Council in December 2013 who confirmed that the proposed methodology, assumptions and suggested mitigation would be acceptable.

Assessment Methodology

12.3.7 The EIA Regulations require the description of the forecasting methods used to assess the effects on the environment. Therefore, the EIA has been based on a widely used and accepted 'significance matrix assessment approach' which is based on the characteristics of the impact (magnitude and nature) and the sensitivity of the receptor. This allows the relative significance of effects to be determined on a scale and ultimately the significant effects determined, as explained in the following subsections. Where a deviation from this approach has been undertaken, reference has been made in the appropriate sections.

Receptor Sensitivity

12.3.8 Key receptors to noise generally include individual or groups of residential properties, hospitals and schools. Table 12.2 provides examples of the different sensitivities which can be assigned to different receptors according to WYG's assessment methodology.

Table 12.2 Methodology for Assessing Sensitivity of Noise

Sensitivity	Example of Receptor
High	Residential properties (Permanent tenants) and schools and hospitals
Medium	Transient residential receptors such as users of hotels
Low	Commercial premises

Determining Impact Magnitude

12.3.9 Guidance with regard to assessing the magnitude of noise impact is available within the Draft Guidelines for Noise Impact Assessment that has been jointly issued by the Institute of Environmental Management and Assessment (IEMA) and Institute of Acoustics (IOA) 2002. The guidance indicates broad parameters with respect to categorising the significance of the basic noise change. For the purpose of this ES, the categories outlined in Table 12.3 below form a broad basis to present the impact magnitude. However, the guidance does not specify what a negligible impact is. Therefore, as a change in noise level of less than 1 dB(A) is imperceptible, changes in noise levels of between 0.1 – 0.9 will refer to a negligible impact.

Table 12.3 Method for Assessing the Magnitude of the Impact

Change in noise level (dB(A))	Category
0	No Impact
0.1 – 0.9	Negligible Impact
1.0 – 2.9	Slight Impact
3.0 – 4.9	Moderate Impact
5.0	Substantial Impact

12.3.10 As human perception to noise is subjective, a flexible approach to the categories specified in the above as zero will be undertaken in the context of the proposals and the location of the Site. The IEMA/IOA guidance stipulates that the noise level categories should not be used strictly to define the description of the noise change as there is no simple formulaic approach for relating noise change to a verbal description such as 'slight' or 'moderate'. Therefore, the magnitude of noise impact should be stated as the predicted dB(A) level and not simply as an impact category.

12.3.11 With regard to road traffic noise, Tables 3.1 and 3.2 of DMRB Volume 11 Section 3 Part 7 (HD 213/11) present examples classification of the magnitude of noise impacts in the short and long term suitable for the assessment of changes in traffic noise levels. Table 3.1 of DMRB has the same categories as those presented in 0. Therefore, the magnitude of road traffic noise impacts in the short term is based on the method presented in 0. For long term impacts, the impact magnitude classification is presented in 0 below. To ensure consistency with the WYG framework terminology, the DMRB descriptors have been translated into WYG terminology.

Table 12.4 Classification of Magnitude of Road Traffic Noise Impacts in the Long Term

Change in noise level (dB(A))	Magnitude
0	Neutral Impact
0.1 – 2.9	Negligible
3 – 4.9	Slight Impact
5 – 9.9	Moderate Impact
10+	Substantial Impact

Determining the Significance of Potential Effects (Based on a Matrix Approach)

12.3.12 The level of significance of each impact is determined by combining the impact risk with the sensitivity of the receptor. Table 12.5 shows how the interaction of magnitude and sensitivity can be combined to determine the significance of an environmental effect.

12.3.13 If an impact magnitude is negative then the resulting effect is described as being adverse; if an impact magnitude is positive the resulting effect is classed as being beneficial.

Table 12.5 Significance of Effects Matrix

Sensitivity of Receptor	Magnitude of Impact				
	Substantial magnitude	Moderate magnitude	Slight magnitude	Negligible magnitude	Neutral
High	Major	Major-moderate	Moderate	Minor	Minor-Neutral
Medium	Major-Moderate	Moderate	Minor	Minor – Neutral	Neutral
Low	Moderate	Minor	Minor – neutral	Neutral	Neutral

12.3.14 For the purposes of this EIA, an effect identified as being of major - moderate significance or greater is considered to be significant. This equates to an increase in noise level of 3dB (A) as a result of the proposals. The assessments presented within Section 12.6 follow this approach.

12.3.15 A deviation from this approach has been undertaken with regard to the assessments presented within Appendix 12.1. The adopted methodology is reflective of establishing whether predicted noise levels from the source under consideration meet noise limit criteria which are based on either absolute levels which relate to relevant guidance documents or on baseline noise data. For the purpose of this ES, where predicted noise levels are determined to fall within the adopted noise limits the effect will not be significant.

12.3.16 Effects during the construction phase have been assessed qualitatively based on the professional judgement of the assessor.

Planning Practice Guidance

12.3.17 The Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6th March 2014 to support the National Planning Policy Framework and make it more accessible. With respect to noise, the national Planning Practice Guidance (PPG) provides the following summary of the effects of noise exposure: For the purpose of this assessment the relating target noise level criteria are found in the noise assessment at Appendix 12.1.

Limitations of the Assessment

12.3.18 At this stage specific details regarding proposed noise generating sources, such as construction works, are not currently available. As specific details regarding the construction techniques and types of plant can only be estimated at present, it is difficult to predict accurately the potential magnitude of potential noise effects on local receptors.

12.4 Baseline Conditions

Existing baseline

12.4.1 Potentially sensitive receptors located in the vicinity of the Site are identified in the relevant sections within this ES. As a general summary, receptors include residential premises which are located adjacent to the local road network. In addition, residential properties surrounding the proposed Site comprise the closest sensitive receptors with respect to construction noise. These are all considered to be receptors of high sensitivity. The location of the identified sensitive receptors associated with proposed Site are presented on Figure 12.2 and tabulated in the table below.

Table 12.6 Receptor Locations for the Site

Ref.	Description	Co-ordinates		
		X	Y	Height (m)
TR1	128, Loughborough Road	450445.9	321811.6	4.0
TR2	89, Loughborough Road	450250.4	321895.2	4.0
TR3	1a, Wide Street	450209.4	321975.7	4.0
TR4	2, Loughborough Road	450019.5	322207.4	4.0
TR5	7, Shepshed Road	449931.4	322226.5	4.0
TR6	47, Shepshed Road	449740.2	322131.3	4.0
TR7	Oakley Cottage, Hathern	448760.2	321200.8	4.0
TR8	78a, Hathern Road	448333.9	320545.5	4.0
TR9	13, Hathern Road	448180	320302.5	4.0
TR10	12, Forest Street	448282.3	319693.2	4.0
TR11	82, Forest Street	448264.7	319519.2	4.0
TR12	23, Westoby Close	448620.5	319475.7	4.0
TR13	22, Leicester Road	448213	319207.2	4.0
TR14	25, Cumbrian Way	448645.8	319362.5	4.0
TR15	21, Purbeck Avenue	448701.3	319100.4	4.0
TR16	72, Fairway Road	448640.1	318937	4.0
TR17	21, Brendon Close	448385.4	318380.1	4.0
TR18	575, The Cube, New Ashby Road	450164	318481.3	4.0
TR19	42, Abberton Way	450247.8	318512	4.0
TR20	Hotel, New Ashby Road	450561	318551.8	4.0
TR21	535, New Ashby Road	450947.3	318621.7	4.0
TR22	447, New Ashby Road	451295.1	318838.5	4.0
TR23	John Philipps Hall, Loughborough University	451558.7	318981	4.0
TR24	403, New Ashby Road	451498.3	319044.2	4.0
TR25	357, New Ashby Road	451641.4	319174.9	4.0
TR26	33, Costwold Close	451942.7	319404.2	4.0
TR27	6, Grove Road	452419.6	319434.1	4.0
TR28	216, Ashby Road	452392.5	319499.9	4.0
TR29	217, Ashby Road	452392.5	319535.9	4.0
TR30	John Philipps Court, Garendon Road	452241.4	319625	4.0
TR31	60, Garendon Road	452188.4	319706.5	4.0
TR32	35, Burns Road	451994.1	320030.2	4.0
TR33	8, Copeland Crescent	451915.2	320249.7	4.0
TR34	15, Sir Robert Martin Court, Windsor Road	451774.7	320346	4.0
TR35	15, Orwell Close	451804.2	320488.2	4.0
TR36	52, Warwick Way	452098.5	320612.5	4.0
TR37	11, Thorny Close	452006.3	320917.5	4.0
TR38	Apple Tree Cottage, Dishley Mill, Derby Road	451656.7	321044.7	4.0
TR39	158, Braddon Road	451317.8	321076.3	4.0
TR40	2 Dishley Cottage, Derb	450934.8	321167.7	4.0
TR41	Temple of Venus	449769.5	319052.5	4.0
TR42	Obelisk	450837.7	319873.6	4.0

12.4.2 A noise monitoring survey was undertaken between 7th and 12th August 2013 in order to define the noise environment at and around the Site. The monitoring locations chosen to represent existing and proposed receptors include the following:

- North-eastern Boundary of the Site, adjacent to the A6(T), Derby Road (LT1)
- Northern Boundary of the Site, adjacent to Shepshed Road (LT2)
- Western Boundary of the Site, (LT3)
- Western Boundary of the Site, adjacent to the M1(LT4)
- Southern Boundary of the Site, adjacent to the M1 (LT5)
- Eastern Boundary of the Site, Behind Coe Avenue (LT6)
- Opposite Daisy Cottage, A6(T) Derby Road (ST1)
- Outside 18, Garendon Avenue (ST2)
- Lay-by on Shepshed Road (ST3)
- Opposite 78a Hathern Road (ST4)
- Middle of Butthole Lane south of Refuse Tip (ST5)
- On the M1/A512(T) roundabout (ST6
- Opposite the junction of Snell's Nook Lane and the A512(T) Ashby (ST7)
- Outside 25 Prestbury Road (ST8)
- Outside 5, Kingswood Avenue (ST9)

12.4.3 A summary of the noise results from survey is presented in Table 12.7 below. A visual representation of the monitoring locations is shown on Figure 12.1.

Table 12.7 Daytime Noise Survey Results

Location	Monitoring Date and Times	Average LAeq (dB)	Average LA90 (dB)
LT1	26/09/2013 - 03/10/2013 07:00 - 23:00	70.7	56.8
LT2	26/09/2013 - 03/10/2013 07:00 - 23:00	59.3	53.1
LT3	26/09/2013 - 03/10/2013 07:00 - 23:00	52.1	47.7
LT4	26/09/2013 - 03/10/2013 07:00 - 23:00	62.4	62.0
LT5	03/10/2013 - 09/10/2013 07:00 - 23:00	70.3	67.1
LT6	03/10/2013 - 09/10/2013 07:00 - 23:00	49.7	45.7
LT1	28/09/2013 - 29/09/2013 07:00 - 23:00	69.4	54.4
LT2	28/09/2013 - 29/09/2013 07:00 - 23:00	49.4	38.6
LT3	28/09/2013 - 29/09/2013 07:00 - 23:00	50.6	43.9
LT4	28/09/2013 - 29/09/2013 07:00 - 23:00	59.6	59.2

Location	Monitoring Date and Times	Average LAeq (dB)	Average LA90 (dB)
LT5	05/10/2013 - 06/10/2013 07:00 - 23:00	69.6	66.9
LT6	05/10/2013 - 06/10/2013 07:00 - 23:00	47.0	43.5
ST1	03/10/2013 14:54:36	75.4	64.3
ST2	03/10/2013 15:15:14	52.0	46.5
ST3	03/10/2013 15:36:08	74.3	52.7
ST4	03/10/2013 15:57:29	68.2	66.2
ST5	03/10/2013 16:29:49	57.2	54.7
ST6	03/10/2013 17:10:04	81.9	77.6
ST7	03/10/2013 17:37:42	75.9	65.6
ST8	03/10/2013 18:09:45	52.7	44.6
ST9	03/10/2013 18:33:28	47.6	44.2

Table 12.8 Evening Noise Survey Results

Location	Monitoring Date and Times	Average LAeq (dB)	Average LA90 (dB)
ST1	02/10/2013 19:47:51	68.9	49.8
ST2	02/10/2013 20:08:59	45.4	40.8
ST3	02/10/2013 20:30:39	66.2	44.6
ST4	02/10/2013 20:51:11	64.9	62.0
ST6	02/10/2013 21:23:17	79.0	71.0
ST7	02/10/2013 21:45:13	74.3	59.9
ST8	02/10/2013 22:10:30	42.4	37.6
ST9	02/10/2013 22:31:53	43.1	37.6

Table 12.9 Night-time Noise Survey Results

Location	Monitoring Date and Times	Average LAeq (dB)	Average LA90 (dB)
LT1	26/09/2013 - 03/10/2013 23:00 - 07:00	63.3	39.2
LT2	26/09/2013 - 03/10/2013 23:00 - 07:00	50.4	41.3
LT3	26/09/2013 - 03/10/2013 23:00 - 07:00	47.7	43.5
LT4	26/09/2013 - 03/10/2013 23:00 - 07:00	59.6	58.1
LT5	03/10/2013 - 09/10/2013 23:00 - 07:00	64.5	57.0

Location	Monitoring Date and Times	Average LAeq (dB)	Average LA90 (dB)
LT6	03/10/2013 - 09/10/2013 23:00 - 07:00	45.7	42.2
LT1	28/09/2013 - 29/09/2013 23:00 - 07:00	62.2	38.1
LT2	28/09/2013 - 29/09/2013 23:00 - 07:00	58.4	52.5
LT3	28/09/2013 - 29/09/2013 23:00 - 07:00	45.0	41.0
LT4	28/09/2013 - 29/09/2013 23:00 - 07:00	57.1	55.7
LT5	05/10/2013 - 06/10/2013 23:00 - 07:00	63.3	59.5
LT6	05/10/2013 - 06/10/2013 23:00 - 07:00	42.6	40.2
ST1	03/10/2013 02:33:26	57.4	37.0
ST2	03/10/2013 02:14:34	40.1	33.8
ST3	03/10/2013 01:52:49	54.2	44.2
ST4	03/10/2013 01:33:26	59.2	53.9
ST6	03/10/2013 00:29:29	75.3	64.7
ST7	03/10/2013 00:05:43	68.9	46.8
ST8	02/10/2013 23:43:02	41.5	33.7
ST9	02/10/2013 23:20:21	39.3	36.2

Future baseline

12.4.4 It is considered that the future baseline at the identified receptors will be broadly similar to the existing baseline given their locality to the local road network. An assessment has been made of the change in road traffic noise during 2021 and 2031 at identified sensitive receptors which takes into account committed and cumulative effects.

12.4.5 With regard to construction works, the future baseline of the Site will change as the Development phasing progresses. Therefore new residential receptors will be present within the future baseline as the Development proceeds to completion.

12.5 Mitigation within the Submitted Design

Construction

12.5.1 No specific details with regard to construction stage design mitigation have been incorporated within the scheme assessed at this stage as this will fall within the remit of the Contractor to develop and implement based on the additional mitigation identified in section 12.6 and any future mitigation identified as required.

12.6 Potential Environmental Effects of the Scheme

Construction Impacts and Effects

12.6.1 The most notable impacts due to increases in noise during construction would be during periods of earthworks and remediation, construction of Site infrastructure and the construction of substructures. In addition to on-site sources, increased noise may be caused by HGV movements travelling to and from the Site during construction.

12.6.2 Exact details regarding the construction techniques and types of plant can only be estimated at present and, therefore, it is difficult to predict accurately the potential magnitude of potential noise effects on local receptors. As such, the potential impact of construction noise is assessed qualitatively.

12.6.3 Given the nature of such works there is the likelihood that during certain periods of the construction phase, noise would be audible at residential receptors located within proximity to where the works are being undertaken, in particular when off-site highway works are being undertaken. Any impacts will be temporary in nature and adverse. The level of noise and associated impact with be dependent on the on the location of the construction activities on a daily basis and the equipment being used, with noise levels being attenuated as the distance between the source and receptor increases.

12.6.4 Through the use of standard noise control measures, effects which could potentially be significant are not anticipated. Examples of such measures are presented in Section 12.7.6.

Operational Impacts and Effects

12.6.5 The potential exists for noise from the proposals to impact upon nearby sensitive receptors located within proximity to the Site such as residential premises off A6(T), Hathern Road, and the A512(T) as well as within the wider study area, Impacts could arise from the following sources:

- Road traffic noise from development generated vehicles on the local road network and the proposed building of a new relief road within the development.

Off-site Road Traffic Noise Assessment

12.6.6 In terms of road traffic noise, relatively sizeable changes in traffic levels are required to cause perceptible increases in noise level. DMRB states that a change in noise level of 1 dB(A), which represents the lowest change perceptible to the human ear, would be produced by an increase in traffic flow of approximately 25%. This assumes that other factors remain broadly unchanged (i.e. average speed and percentage of HGVs using the road).

12.6.7 Traffic data has been provided by WYG in 18hr Annual Average Weekday Traffic (AAWT) format for the years 2016 and 2031. HGV percentages have also been provided. The 'with development' flows are presented as the Do Something (i.e including the effects of the proposed scheme and expected or committed changes in baseline) (DS) and the 'without development' flows are presented as the Do Minimum (i.e. without the effects of the proposed scheme but including expected or committed changes in baseline) (DM) for each assessment year.

12.6.8 The following scenarios have been assessed:

- 2021DM = Baseline + Committed Development
- 2021 DS = 2021 Base+ The Development + Committed Development
- 2031 DM = Baseline + Committed Development
- 2031 DS = 2031 Base + The Development + Committed Development

12.6.9 Noise modelling has been undertaken between the DM and DS scenarios for 2016 and 2031 assessment years to establish the change in noise level at identified receptors. The noise modelling has been undertaken using CadnaA software in accordance with the guidance provided within CRTN. A summary of the findings and the associated effect of the proposals in EIA terms is presented below.

12.6.10 A visual representation of the 2021 DM and 2031 DS noise contour plots are provided in Figures 12.3 and 12.4. Grids which provide a visual representation of the change in noise level are presented in Figure 12.5.

Table 12.10 Changes in Road Traffic Noise Levels in 2021

Noise Model Reference	Location	2016		Change in noise level dB $L_{A10(18 hr)}$	Magnitude of Impact	Significance of Effects
		Do Minimum dB $L_{A10(18 hr)}$	Do Something dB $L_{A10(18 hr)}$			
TR1	128, Loughborough Road	72.7	73.2	0.5	Negligible	Minor
TR2	89, Loughborough Road	70.1	70.5	0.4	Negligible	Minor
TR3	1a, Wide Street	68.4	68.6	0.2	Negligible	Minor
TR4	2, Loughborough Road	70.9	71.3	0.4	Negligible	Minor
TR5	7, Shepshed Road	71	71.6	0.6	Negligible	Minor
TR6	47, Shepshed Road	68.5	69	0.5	Negligible	Minor
TR7	Oakley Cottage, Hathern	63.8	63.9	0.1	Negligible	Minor
TR8	78a, Hathern Road	66.6	66.6	0.0	Negligible	Minor
TR9	13, Hathern Road	65.9	65.9	0.0	Negligible	Minor
TR10	12, Forest Street	68.3	68.5	0.2	Negligible	Minor
TR11	82, Forest Street	67.6	67.7	0.1	Negligible	Minor
TR12	23, Westoby Close	59.4	59.1	-0.3	Negligible	Minor
TR13	22, Leicester Road	67.4	67.4	0.0	Negligible	Minor
TR14	25, Cumbrian Way	59.9	59.8	-0.1	Negligible	Minor
TR15	21, Purbeck Avenue	61.3	60.5	-0.8	Negligible	Minor
TR16	72, Fairway Road	55.5	55.1	-0.4	Negligible	Minor

Noise Model Reference	Location	2016		Change in noise level dB $L_{A10(18 hr)}$	Magnitude of Impact	Significance of Effects
		Do Minimum dB $L_{A10(18 hr)}$	Do Something dB $L_{A10(18 hr)}$			
TR17	21, Brendon Close	62.9	63.1	0.2	Negligible	Minor
TR18	575, The Cube, New Ashby Road	72.1	72.5	0.4	Negligible	Minor
TR19	42, Abberton Way	69.7	70.1	0.4	Negligible	Minor
TR20	Hotel, New Ashby Road	71	71.3	0.3	Negligible	Minor
TR21	535, New Ashby Road	69.9	70.2	0.3	Negligible	Minor
TR22	447, New Ashby Road	70.9	71.2	0.3	Negligible	Minor
TR23	John Philipps Hall, Loughborough University	69	69.3	0.3	Negligible	Minor
TR24	403, New Ashby Road	70.4	70.7	0.3	Negligible	Minor
TR25	357, New Ashby Road	69	69.3	0.3	Negligible	Minor
TR26	33, Costwold Close	67.9	68.2	0.3	Negligible	Minor
TR27	6, Grove Road	67.1	67.3	0.2	Negligible	Minor
TR28	216, Ashby Road	69.5	69.8	0.3	Negligible	Minor
TR29	217, Ashby Road	69.1	69.2	0.1	Negligible	Minor
TR30	John Philipps Court, Garendon Road	66.1	66.4	0.3	Negligible	Minor
TR31	60, Garendon Road	66.7	67	0.3	Negligible	Minor
TR32	35, Burns Road	67.9	68.2	0.3	Negligible	Minor
TR33	8, Copeland Crescent	68.2	68.5	0.3	Negligible	Minor
TR34	15, Sir Robert Martin Court, Windsor Road	69	69.3	0.3	Negligible	Minor
TR35	15, Orwell Close	63.4	63.7	0.3	Negligible	Minor
TR36	52, Warwick Way	68.2	68.6	0.4	Negligible	Minor
TR37	11, Thorny Close	69.2	69.5	0.3	Negligible	Minor
TR38	Apple Tree Cottage, Dishley Mill, Derby Road	70	70.7	0.7	Negligible	Minor
TR39	158, Braddon Road	67.3	67.6	0.3	Negligible	Minor
TR40	2 Dishley Cottage, Derb	71.1	71.3	0.2	Negligible	Minor
TR41	Temple of Venus	57.2	57.3	0.1	Negligible	Minor
TR42	Obelisk	49.9	50.4	0.5	Negligible	Minor

12.6.11 All receptors assessed within the study area the change in noise levels is less than 1dB which, in accordance with the criteria presented in Table 12.3 has a resultant negligible impact. The significance of adverse effects is considered to be minor. The impact will be long term, permanent and direct.

12.6.12 The proposals are not predicted to result in effects which are significant in EIA terms.

Table 12.11 Changes in Road Traffic Noise Levels in 2031

Noise Model Reference	Location	2031		Change in noise level dB $L_{A10(18 hr)}$	Magnitude of Impact	Significance of Effects
		Do Minimum dB $L_{A10(18 hr)}$	Do Something dB $L_{A10(18 hr)}$			
TR1	128, Loughborough Road	73.1	73.5	0.4	Negligible	Minor
TR2	89, Loughborough Road	70.6	70.8	0.2	Negligible	Minor
TR3	1a, Wide Street	68.8	69	0.2	Negligible	Minor
TR4	2, Loughborough Road	71.4	71.7	0.3	Negligible	Minor
TR5	7, Shepshed Road	71.5	71.9	0.4	Negligible	Minor
TR6	47, Shepshed Road	68.9	69.2	0.3	Negligible	Minor
TR7	Oakley Cottage, Hathern	64.2	65.7	1.5	Slight	Moderate
TR8	78a, Hathern Road	67	67	0.0	Negligible	Minor
TR9	13, Hathern Road	66.3	66.2	-0.1	Negligible	Minor
TR10	12, Forest Street	68.8	67.3	-1.5	Negligible	Minor
TR11	82, Forest Street	68	66.4	-1.6	Negligible	Minor
TR12	23, Westoby Close	59.8	60.2	0.4	Negligible	Minor
TR13	22, Leicester Road	67.8	66.1	-1.7	Negligible	Minor
TR14	25, Cumbrian Way	60.4	60.8	0.4	Negligible	Minor
TR15	21, Purbeck Avenue	61.7	61.5	-0.2	Negligible	Minor
TR16	72, Fairway Road	55.9	56.1	0.2	Negligible	Minor
TR17	21, Brendon Close	63.3	63	-0.3	Negligible	Minor
TR18	575, The Cube, New Ashby Road	72.6	71.6	-1.0	Negligible	Minor
TR19	42, Abberton Way	70.1	69.2	-0.9	Negligible	Minor
TR20	Hotel, New Ashby Road	71.4	70.4	-1.0	Negligible	Minor
TR21	535, New Ashby Road	70.3	69.4	-0.9	Negligible	Minor
TR22	447, New Ashby Road	71.3	70.3	-1.0	Negligible	Minor
TR23	John Philipps Hall, Loughborough University	69.4	68.4	-1.0	Negligible	Minor

Noise Model Reference	Location	2031		Change in noise level dB $L_{A10(18hr)}$	Magnitude of Impact	Significance of Effects
		Do Minimum dB $L_{A10(18hr)}$	Do Something dB $L_{A10(18hr)}$			
TR24	403, New Ashby Road	70.9	69.9	-1.0	Negligible	Minor
TR25	357, New Ashby Road	69.4	68.4	-1.0	Negligible	Minor
TR26	33, Costwold Close	68.3	67.4	-0.9	Negligible	Minor
TR27	6, Grove Road	67.6	67.7	0.1	Negligible	Minor
TR28	216, Ashby Road	70	69.8	-0.2	Negligible	Minor
TR29	217, Ashby Road	69.5	69.5	0.0	Negligible	Minor
TR30	John Philipps Court, Garendon Road	66.6	65.5	-1.1	Negligible	Minor
TR31	60, Garendon Road	67.2	66.1	-1.1	Negligible	Minor
TR32	35, Burns Road	68.3	67.3	-1	Negligible	Minor
TR33	8, Copeland Crescent	68.6	67.5	-1.1	Negligible	Minor
TR34	15, Sir Robert Martin Court, Windsor Road	69.4	68.4	-1.0	Negligible	Minor
TR35	15, Orwell Close	63.8	62.8	-1.0	Negligible	Minor
TR36	52, Warwick Way	68.7	67.7	-1.0	Negligible	Minor
TR37	11, Thorny Close	69.6	69.9	0.3	Negligible	Minor
TR38	Apple Tree Cottage, Dishley Mill, Derby Road	70.5	71.1	0.6	Negligible	Minor
TR39	158, Braddon Road	67.7	68	0.3	Negligible	Minor
TR40	2 Dishley Cottage, Derb	71.5	71.7	0.2	Negligible	Minor
TR41	Temple of Venus	57.6	58	0.4	Negligible	Minor
TR42	Obelisk	50.3	51.4	1.1	Slight	Minor

12.6.13 By 2031, it is predicted that the change in noise level will be comparable or lower than that in 2021.

12.6.14 All receptors, or locations which are representative of groups of receptors, within 300m of off-site highway works have been assessed in accordance with the guidance provided within the Noise Insulation Regulations (NIR). Based on the predicted changes in noise level specified within the tables above, no properties are above the threshold for eligibility for mitigation works under the NIR, it should be noted that the NIR only apply to noise from new or altered highways, i.e the proposed access road.

12.6.15 DMRB states that 1 dB(A) is the smallest change in short term noise level considered to be perceptible. Therefore, it is considered that the overall effect will not be significant in EIA terms

as the highest stated change in noise level of 1.1 dB(A) at nearby properties will be of minor significance.

12.7 Additional Mitigation, Compensation and Enhancement Measures

12.7.1 The following sections below identify the measures which will be required to reduce the impacts detailed in section 12.6 as far as is practicable.

Construction

12.7.2 Construction works may be subject to control by suitably worded planning conditions. Given the absence of detailed information at this outline stage in relation to construction methods and programmes, it is recommended that 'Best Practicable Means' should be employed to minimise any impacts.

12.7.3 The proposed CEMP is an appropriate document within which appropriate procedures and methods can be specified to protect noise sensitive receptors. This will include a series of specific method statements identifying methods of working and controls to address the development's construction noise impacts. The CEMP will be implemented during the construction phase. Mitigation measures specified below have been included as an example of suitable mitigation measures and should not be regarded as an exhaustive list. Therefore, the following additional mitigation should be considered the minimum additional mitigation required to control and minimise noise impacts from such associated activities:

- Careful selection of working methods and programme;
- Selection of quietest working equipment available (e.g. electric/battery powered equipment which is generally quieter than petrol/diesel powered equipment);
- Positioning equipment behind physical barriers, i.e. existing features, hoarding, etc., or provision of lined and sealed acoustic covers for equipment that could potentially contribute to a noise nuisance;
- Positioning of noise generating equipment, such as any blending plant in areas which minimise noise as far as practicable;
- Directing noise emissions away from plant including exhausts or engines away from sensitive locations;
- Ensuring that regularly maintained and appropriately silenced equipment is used;
- Shutting down equipment when not in use, i.e. maintain a 'no idling policy';
- Handling all materials in a manner which minimises noise;
- Switch all audible warning systems to the minimum setting required by the Health and Safety Executive;
- Restricting hours of site operation in agreement with the Local Authority. If there is the requirement to undertake work outside of the agreed hours, further consultation should be undertaken with the Local Authority;

- Where processes could give rise to significant levels of noise, noise levels should be monitored regularly by a suitably qualified person. The methodology of any surveys should be agreed with the Local Authority;
- Employ best practices and follow guidance of British Standard 5228 – Parts 1 and 2.

12.7.4 The Local Planning Authority is provided with powers under the Control of Pollution Act 1974 to control noise from construction sites including, if necessary, serving notices under the Section 60 to specify working practices.

Operation

12.7.5 No additional measures are required to address operational noise effects.

12.8 Residual Environmental Effects

12.8.1 During the construction phases, it is anticipated that through appropriate mitigation (suitable design practices adhered to by the Contractor) potentially significant noise effects can be minimised so that residual significant effects would not arise. This can be controlled by consented conditions.

12.8.2 In terms of development generated road traffic noise, predicted impacts range from negligible to slight at receptors which range from medium to high sensitivity. The significance of effects will therefore be minor adverse.

12.8.3 A further assessment was undertaken with regard to the eligibility of existing residents for mitigating works in accordance with the Noise Insulation Regulations. The assessment establishes that the threshold for eligibility is not reached.

12.9 Cumulative Impacts

12.9.1 The cumulative effects of the scheme are included in the 'Do Something' scenarios as these traffic flows include the combined effects of the baseline, Development and committed developments.

12.10 Conclusion

12.10.1 A noise assessment has been undertaken with regard to assessing the potential noise impacts of the Development during both the construction and operational phases. The baseline noise environment has been established with existing and proposed receptors identified. A supplementary Noise Assessment has been provided at Appendix 12.1.

12.10.2 Assuming a worst case scenario, potentially significant environmental effects associated with the Development during the construction and operational phases could occur with regard to noise. During the construction phases, following the adoption of suitable mitigation, potentially significant noise effects can be reduced to minimise potential adverse impacts and it is not anticipated that significant impacts would arise. This can be controlled through consent conditions.

12.10.3 With regard to the operational phase noise, road traffic has been assessed; the change in noise level as a result of the Development in 2021 and 2031 has been assessed as well as the cumulative effects relating to other committed and non-committed developments. The change in road traffic noise level as a result of the proposals will be generally barely, if at all, perceptible.

Due to the very low change in road traffic noise level, it is considered that the effect will typically not be significant.

12.10.4 A noise assessment has also been undertaken with regard to the impact of existing and potential future noise generation at proposed receptors (future residents) in order to demonstrate that acceptable levels of amenity can be achieved. This assessment is presented in the supplementary Noise Assessment at Appendix 12.1.

13 HYDROLOGY AND WATER QUALITY

13.1 Introduction

13.1.1 This Chapter assesses the impact of the Development on drainage and flood risk, both to the Site and the surrounding area. A Flood Risk Assessment (FRA) forms Appendix 13.1 to this Environmental Statement and provides the basis for this Chapter.

13.1.2 The Chapter describes the methods used to assess the impacts, the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect impacts of the Development arising from drainage and flood risk, the mitigation measures required to prevent, reduce, or offset the impacts and the residual impacts. It has been written by Peter Brett Associates LLP (PBA).

13.1.3 This Chapter is informed by a FRA (PBA, 2014) that is presented as Appendix 13.1.

13.2 Legislation, Policy and Guidance

National Policy

National Planning Policy Framework

13.2.1 National Planning Policy Framework (NPPF) and the accompanying Planning Practice Guidance (PPG) sets out the Government's national policy on development and flood risk. Its aims are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk. In exceptional circumstances where new development is necessary in flood risk areas the policy also aims to ensure it is safe, without increasing flood risk elsewhere, and where possible, reducing flood risk overall.

13.2.2 The NPPF advocates the use of a risk based sequential test, in which new development is directed towards the areas of lowest risk of flooding. The different areas of flooding by the following Flood Zones:

- Flood Zone 1:Low probability of flooding (less than 1 in 1,000 annual probability of river or sea flooding in any year);
- Flood Zone 2:Medium probability of flooding (between a 1 in 100 and 1 in 1,000 annual probability of river flooding and between a 1 in 200 and 1 in 1,000 annual probability of tidal flooding in any year);
- Flood Zone 3a:High probability (1 in 100 or greater annual probability of river flooding or 1 in 200 or greater annual probability of sea flooding in any year); and
- Flood Zone 3b:The functional floodplain (where water is stored in times of flood, including water conveyance routes, annual probability of 1 in 20 or greater in any given year).

It should be noted that according to the PPG definitions, the above flood zones ignore the presence of flood defences.

13.2.3 In addition, the PPG outlines the type of land use, defined by the flood risk vulnerability that is appropriate in each Flood Zone. For example, more sensitive developments that would be most severely affected in the event of flooding, such as hospitals, should not be permitted in areas at high probability of flooding, although leisure and tourism developments may be allowed in Flood Zone 3a.

13.2.4 The PPG also provides further guidance and how all development must include appropriate consideration of the potential effects of climate change on flooding and the hydrological regime. PPG references the Environment Agency's 'Climate change allowances for planners' that recommends a precautionary increase in fluvial flows of 10% by 2025 and 20% from 2025 to 2112 in rivers, with rainfall intensities gradually increasing by between 5% and 30% from now until 2115.

13.2.5 The Environment Agency (EA)'s 'Flood Risk Standing Advice for planning applicants and their agents in England' was issued in April 2012. This provides further guidance on how to apply NPPF and when a FRA is required and the scope for site specific FRAs, depending on the type of development and probability of flooding.

The Water Framework Directive

13.2.6 The aim of the Water Framework Directive (WFD), published by the European Parliament and Council in 2000, is to establish "good ecological and chemical status in all surface waters and groundwaters". It also promotes the importance of sustainable water use. During the implementation process, Local Planning Authorities must not act in a way to compromise the WFD's aims. As part of the planning process, powers to control diffuse pollution at the source should be introduced to meet the obligations under the WFD.

13.2.7 The WFD is implemented via River Basin Management Plans, which will be produced for each river basin district every six years.

Flood and Water Management Act

13.2.8 The Flood and Water Management Act (2010) takes forward some of the proposals from three previous strategy documents published by the UK Government - Future Water (2008), Making Space for Water (2008) and the UK Government's response to the Sir Michael Pitt's Review of the summer 2007 floods. In doing so it gives the EA a strategic overview role for flood risk, and gives local authorities responsibility for preparing and putting in place strategies for managing flood risk from groundwater, surface water and ordinary watercourses in their areas.

13.2.9 The Flood and Water Management Act also introduces the concept of the Sustainable Drainage Systems (SuDS) Approving Bodies (SAB). In most cases, these bodies will be the same as the Lead Local Flood Authority i.e. for this location it will be the Leicestershire County Council. Once the SAB is set up, the SAB will be required to adopt any approved SuDS unless it serves a single property or forms part of a public highway, provided it meets the design standards specified in the National Standards for SuDS. Any SuDS features that form part of the Development will need to meet the SAB's requirements and approval unless suitable alternative management procedures are in place.

13.2.10 Further standards and guidelines, which will determine the full extent of the Act, are yet to be published, although some have been issued in draft form.

Flood Risk Regulations

13.2.11 The Flood Risk Regulations (2009) implement the requirements of the European Flood Directive (2007), which is a sister directive of the Water Framework Directive (2000). The purpose of the Regulations is to ensure a consistent approach to managing flood risk, including the publication of Preliminary Flood Risk Assessments (PFRA), hazard and risk maps and flood risk management plans.

National Standards for SuDS for Sustainable Drainage (Consultation Draft)

13.2.12 As a requirement of the Flood and Water Management Act, the Government must publish National Standards and consult on them prior to publication. These standards, prepared by DEFRA, are likely to address the design, construction, maintenance and operation of drainage systems. A consultation draft of standards has been published and covers:

- The runoff destination – with the public sewer as the last resort for the receiving system;
- The peak rate of runoff;
- The volume of runoff;
- The visibility, adaptability and biodiversity of SuDS features; and
- The water quality treatment.

Local Policy

Borough of Charnwood Local Plan

13.2.13 The Local Plan (1991 - 2006) controls the location and nature of new development within the Borough and was adopted in January 2004. This Local Plan is due to be replaced by the new Charnwood Local Plan Core Strategy (see below). The policies in this Local Plan were saved for three years beyond 2004 but in 2007 only a selection were saved by the Secretary of State, and only these are to be used in making planning decisions. One saved policy relates to flood risk and this is Policy EV/29 Access to Watercourses for Maintenance which states:

> *"Planning permission will not be granted for development within 8 metres of the top of the bank or within 8 metres of the landward toe of a flood bank or other flood defence on all main rivers and other watercourses which would obstruct access for future maintenance."*

13.2.14 For those policies that are no longer active, such as that covering surface water run-off and the protection of floodplains, planning decisions will be informed by national policy, confirmed in the NPPF.

Charnwood Local Plan 2006 to 2028: Core Strategy Pre-Submission Draft (2013)

13.2.15 The emerging Core Strategy, which will form part of the new Local Plan for Charnwood, was recently submitted to the Secretary of State for Examination. It provides the strategic framework containing Charnwood Borough Council's Vision and strategic objectives.

13.2.16 Within the Core Strategy, Strategic Objective SO10 is to '*reduce the risk to people and properties through flooding in vulnerable locations such as parts of Loughborough and the Soar and Wreake valley villages*.'

13.2.17 Policy *CS16 Sustainable Construction and Energy* outlines the Council's objective regarding adaptation and mitigation against the effects of climate change, which will be done by:

- Directing development to locations within the Borough at the lowest risk of flooding, applying the Sequential Test and if necessary, applying the Exception Test. Where development is proposed in flood risk areas, mitigation measures must be in place to reduce the effects of flood water;
- Supporting developments which take opportunities to reduce flood risk elsewhere; and
- Requiring developments to manage surface water run off with no net increase in the rate of surface water run off for Greenfield sites;

13.2.18 With particular reference to the area to the west of Loughborough, included as part of 'North Charnwood: Loughborough and Shepshed' as allocation 'West of Loughborough Sustainable Urban Extension', the Strategy outlines the following requirement with respect to flood risk and drainage:

'…*Requiring development that provides appropriate Sustainable Drainage Systems and flood alleviation measures and where possible reduces flood risk in Loughborough in accordance with Policy CS16'*.

13.2.19 Although the emerging Core Strategy is currently at examination, the assessment and conclusions made with respect to hydrology and water quality are consistent with the draft policies of the emerging Core Strategy.

Charnwood Borough Council: Strategic Flood Risk Assessment

13.2.20 In April 2008 Charnwood Borough Council (CBC) published a Level 1 Strategic Flood Risk Assessment (SFRA). The purpose of the SFRA is to assess and map all forms of flood risk, including that from groundwater, surface water, sewer and rivers. It also accounts for potential impacts of climate change. This SFRA is used to inform the location of future development within the Borough.

13.2.21 The SFRA includes incidences of historical fluvial flooding within the Soar catchment (in which the Development is located) but does not mention the Site specifically. No incidences of flooding from any source are specifically given for the Site though the Black Brook has been associated with flooding further downstream in the Thorpe Acre area.

13.2.22 The SFRA identifies indicative areas potentially at risk from fluvial flooding. These areas include broad areas of farmland alongside the Black Brook upstream of Loughborough. Sources of potential flood risk to the Site are stated to include:

- Fluvial flooding from the Black Brook and Oxley Gutter;
- Overland flow from higher land within the south of the Site;
- Blockage/insufficient capacity of bridges/culverts on the Black Brook and Oxley Gutter (including existing structures and any proposed in associated with development); and
- Need to manage runoff in view of downstream flooding and backing-up of the Black Brook when the River Soar is in flood.

Charnwood Borough Council: Strategic Flood Risk Assessment (SFRA)

13.2.23 In 2014 CBC published an updated SFRA for the Borough and includes updated Flood Zone maps showing additional indicative areas at risk from fluvial flooding within the Site.

13.2.24 The SFRA identifies potential flood risks relating to the Site as follows:

- Potential fluvial flooding from the Black Brook, Oxley Gutter and the un-named tributary of the Burleigh Brook (identified here as Shortcliffe Brook);
- Additional risk from surface water flooding and overland flows generated within the Site and from adjacent developments;
- Potential risk from bridge and culvert blockages; and
- Potential for the Site to be used to reduce flood risk downstream through attenuation of flows.

Leicestershire County Council: Preliminary Flood Risk Assessment (FRA)

13.2.25 In June 2011 Leicestershire County Council (LCC) published a Preliminary Flood Risk Assessment (FRA). This was prepared to comply with the Flood and Water Management Act 2010 and Flood Risk Regulations 2009.

13.2.26 It provides a high level summary of significant flood risk, describing both the probability and harmful consequences of past and future flooding.

13.2.27 Within this assessment a Flood Map for Surface Water shows that parts of the Site are at risk of ‘shallow’ and ‘deep’ surface water flooding for the 1 in 200 year storm event.

13.2.28 A map of Areas Susceptible to Groundwater Flooding shows that the Site lies within an area with 25-75% probability of groundwater flooding.

13.2.29 An assessment of the risk of surface water and groundwater flooding to the Site is included within the FRA at Appendix 13.1 of the ES.

River Basin Management Plan: Humber River Basin District

13.2.30 The River Basin Management Plan for the Humber River Basin District has been prepared by DEFRA/EA under the Water Framework Directive and outlines the current ecological status of the River Humber and plans for improvement. This shows that the ecological status of the Black Brook is 'Poor'. No details are given for Oxley Gutter and Shortcliff Brook.

River Trent Catchment Flood Management Plan

13.2.31 The River Trent Catchment Flood Management Plan (CFMP) outlines the scale and extent of flooding in the Trent Catchment and sets out the Environment Agency's policies for managing flood risk within the catchment. The Site lies on the border of Sub Area 8: Rural Leicestershire and Sub Area 9: Upper Soar and Upper Anker.

13.2.32 Sub Area 8 is designated as an area of low to moderate flood risk where the EA plans to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits. There is also an emphasis on identifying locations where flood attenuation ponds or wetland areas can be developed with associated habitat improvement.

13.2.33 Sub Area 9 is designated as an area of low, moderate or high flood risk where flood risk is already managed effective but further actions may be required to mitigate for the impact of climate change. Proposals for this area are include investigations into storage upstream of 'at risk' urban centres and integrated drainage strategies to reduce the incidence of surface water and foul water flooding.

13.2.34 This has been taken into account in assessing flood risk to the Site and when preparing the Surface Water Management Strategy for the Development.

13.3 Assessment Methodology and Significance Criteria

13.3.1 An assessment has been made of the existing flood risk issues and the potential impacts of the Development on flood risk, including the preparation of a surface water management strategy. The details of this assessment area provided in the FRA which is included in Appendix 13.1.

13.3.2 Initial information on potential sources of flooding (fluvial, surface water, groundwater and foul) and historical flooding were collected through a consultation process with the following organisations and relevant authorities:

- Charnwood Borough Council (CBC);
- Leicestershire County Council (LCC);
- Severn Trent Water (STW); and
- Environment Agency (EA).

13.3.3 In addition to the above the following data was gathered:

- Site observations through a number of visits to the Site and relevant watercourses/drainage channels;
- Topographical survey of the whole Site (undertaken by Oakes Surveys in April 2007 and February 2009); and
- Hydrological and hydraulic modelling which was undertaken as part of the FRA to confirm the extents of both Flood Zones 2 and 3 within the Site, see Appendix 13.1. This provides water levels for 1 in 20 year, 100 year, 100 year plus climate change and 1,000 year return period events.

13.3.4 The available information on flood risk has been reviewed in the context of the Development to assess flood risk at the Site and wider area. This is used to inform the Masterplan and principles for development and to determine suitable mitigation measures to be incorporated into the scheme to respond to existing issues and in line with NPPF/PPG requirements or specific requirements of the EA and CBC/LCC.

13.3.5 The Development has the potential to impact on the surface water drainage regime at the Site and its contribution to the receiving systems. A strategy for the management of surface water runoff has been developed to ensure no adverse impact on flood risk at the Site or elsewhere and as part of a strategy to realise opportunities for wider ecological and nature conservation benefits and to provide valuable open space areas.

13.3.6 An assessment of the existing surface water drainage sub catchments and baseline runoff rates for the Site has been undertaken. These results have been used to determine a suitable discharge regime from the Site. From this, an outline strategy including estimates of the potential surface water storage requirements for the Development has been formulated.

13.3.7 The assessments are detailed in the FRA in Appendix 13.1.

13.3.8 The River Basin Management Plan for the Humber River Basin District and water quality data available on the Environment Agency's online maps have been used in the assessment of effects relating to water quality.

13.3.9 Local policy documents and Severn Trent's Water Resources Management Plan have been used in the assessment of effects relating to water resources.

13.3.10 In the ES Scoping Opinion received from Charnwood Borough Council (dated 18th March 2014), including responses from other relevant stakeholders a number of issues were raised regarding the hydrology and water quality aspects of the Development. These are summarised in Table 13.1.

Table 13.1: Issues raised within the Scoping Opinion

Stakeholder	Issue raised	Where and how addressed
Charnwood Borough Council	1. Extend scope of hydrology and water quality assessment to fully address the impacts of: Flood risk and modelling (including newly commissioned SFRA) Surface water management Foul drainage Water quality Protection of controlled water/contaminated land	Issues regarding flood risk and surface water management are assessed within this ES Chapter and a detailed assessment is included within the accompanying FRA. The impact of foul drainage on water quality has been included within the assessment covered by this ES Chapter. Discussions are currently underway with STW to agree a Foul Water Strategy for the site. Issues relating to protection of controlled water/contaminated land are addressed within '*Chapter 14: Geology and Ground Conditions'*.
	2. A Water Framework Directive (WFD) Assessment should be undertaken to '*demonstrate how the watercourses will reach good ecology status etc.'*	Issues relating to the WFD are addressed within the Water Framework Directive Statement that is included as part of the Application.
Environment Agency (EA)	In their response dated 12th March 2014, the EA have listed a number of requirements to be covered by the Environmental Statement with respect to hydrology and water quality. The full response is included in Appendix 13.1. The issues raised are broadly categorised into: - Sequential Test - Flood risk and modelling - Sustainable drainage scheme - Foul drainage/water quality - Protection of controlled waters/contaminated land - Water Framework Directive - Biodiversity	Issues relating to the Sequential Test, flood risk, sustainable drainage and foul drainage/water quality are covered by this ES Chapter and in detail within the FRA and associated modelling reports. Issues relating to protection of controlled water/contaminated land are addressed within *Chapter 14: 'Geology and Ground Conditions'*. Issues relating to the WFD are addressed within the Water Framework Directive Statement that is included as part of the Application. Issues relating to biodiversity are covered by '*Chapter 10: Ecology*'.
Severn Trent Water	1. Foul water: issues were raised regarding the potential for connection to Shepshed Sewage Treatment Works and/or existing networks. Requirement for sewer modelling was raised. 2. Surface water disposal: soakaways should be	Consultation is currently underway with STW to agree a Foul Water Strategy for the Site. This will be implemented as part of the scheme. Due to the underlying impermeable

	considered primarily. If this is not possible STW recommend using local watercourses.	geology, the use of soakaways is not possible. The use of local watercourses for surface water disposal is included in the surface water management strategy for the Site.

Significance Criteria

13.3.11 There are no standard significance criteria for the consideration of flood risk and drainage impacts and it has therefore been necessary to employ a qualitative approach based upon available knowledge and professional judgement.

13.3.12 The significance of pre-mitigation effects and residual effects (i.e. the environmental effects that remain after the incorporation of mitigation measures) have been assessed through consideration of their magnitude, duration and nature (i.e. reversible, irreversible, repairable or non-repairable) and also their geographical context (i.e. highly localised or widespread). The significance criteria are:

- **Major Beneficial:** Major reduction in risk to receptors. Significant local/widespread reduction in flood risk;
- **Moderate Beneficial:** Moderate reduction in risk to receptors. Moderate reduction in localised flood risk;
- **Minor Beneficial:** Minor reduction in risk to receptors. Minor reduction in localised flood risk;
- **Negligible:** No appreciable impact – any minor adverse effects are reversible;
- **Minor Adverse:** Temporary and minor detrimental effect on watercourses. Moderate local flooding;
- **Moderate Adverse:** Moderate detrimental effect on watercourses. Severe temporary flooding or change to flow characteristics of watercourses; and
- **Major Adverse** (would include any of the following): Severe detrimental effect on watercourses. Permanent flooding or change to flow characteristics of watercourses. Increase in the potential for flooding upstream, downstream or within the development Site.

Assumptions / Limitations

13.3.13 This ES Chapter and FRA are based on stakeholder consultation and current policy and guidance.

13.3.14 As part of the hydraulic modelling undertaken for the FRA, assumptions were made regarding the model set up, based on Site observations, such as the choice of manning's n roughness value. To account for these assumptions sensitivity testing was carried out to assess the impact of the assumptions on results.

13.3.15 The EA have been consulted with regards to the hydrological and hydraulic modelling study and have confirmed the suitability of the methodology and the approach to the necessary assumptions.

13.4 Baseline Conditions

13.4.1 To assess the baseline hydrology issues at the Site and the surrounding area, a review of the following has been undertaken:

- Hydrological context;
- Flood risk;
- Existing surface water drainage regime;
- Water quality; and
- Water resources.

Hydrological Context

13.4.2 The Site is located within the Soar catchment, part of the wider River Trent catchment which eventually flows to the Humber Estuary, approximately 100km north east of the Site. There are three watercourses located within the Site: the Black Brook flows in an easterly direction through the northern part of the Site and is designated as 'Main River' according to the EA Flood Map; Oxley Gutter flows in an easterly direction through the middle of the Site and joins the Black Brook at two locations at and beyond the eastern Site boundary; and the Shortcliff Brook flows in an easterly direction through the southern part of the Site and joins the Burleigh Brook beyond the Site boundary to the east. Oxley Gutter and Shortcliff Brook are both classed as ordinary watercourses. A Site location plan is shown in Figure 13.1.

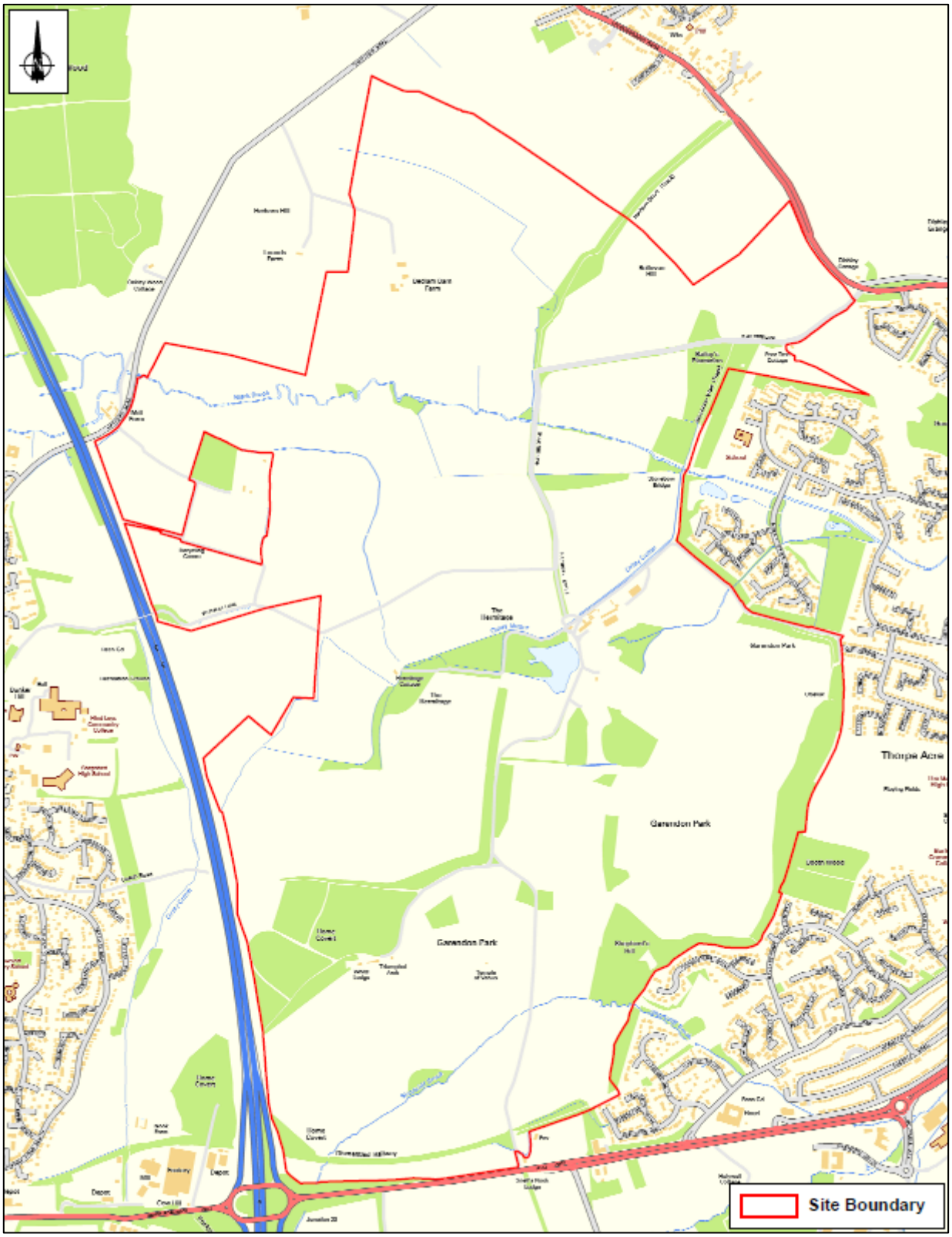

Figure 13.1: Site Location

13.4.3 The River Soar flows in a northerly direction approximately 2km north-east of the Site.

13.4.4 A review of the online geological maps from the British Geological Society (1:50 000 scale) shows that the Site is underlain by a bedrock geology of Mudstone (Gunthorpe member). For parts of the Site, this mudstone is overlain by i) alluvium deposits of clay, silt, sand and gravel ii) Wanlip Member sand and gravel deposits iii) Diamicton (Thrussington Member) and iv) Head deposits of clay, silt, sand and gravel.

13.4.5 Online EA maps show that the Site is not located within a Groundwater Source Protection Zone.

Flood Risk

13.4.6 The EA publishes Flood Maps on the internet (http://www.environment-agency.gov.uk). At this location these maps indicate the possible extent of fluvial flooding in a 1% annual probability (1 in 100 year) event, ignoring the presence of flood defences. Also shown is the possible extent of flooding arising from a 0.1% annual probability (1 in 1,000 year) flood event.

13.4.7 The EA Flood Maps show that the majority of the Site is located within Flood Zone 1. The land immediately either side of the Black Brook is classed as being within Flood Zones 2 and 3. The Oxley Gutter is not classed as Main River and, as such, is not included within the EA Flood Map. Part of the Shortcliff Brook is classed as Main River and the Flood Map shows that there is no flooding for the 1 in 100 year return period event (Flood Zone 3) or the 1 in 1,000 year return period event (Flood Zone 2) associated with the Shortcliff Brook within the Site.

13.4.8 The hydrological and hydraulic modelling undertaken as part of the FRA confirmed the flood extent of Flood Zones 2 and 3 within the Site. Mapping of these results shows that these zones are not as extensive as the EA Flood Maps indicate and confirm that just the area around the Black Brook is affected.

13.4.9 Data obtained from external consultees and general sources combined with the observations from the Site walkover have identified that there are no known flooding issues (including from fluvial, groundwater, surface water or sewer sources) within the Site or area downstream of the Site.

Existing Surface Water Drainage Regime

13.4.10 Two ridges run across the Site from west to east, sloping down in an easterly direction. One ridge is located in the northern part of the Site, north of the Black Brook. The other ridge is located in the southern part of the Site. In the centre of the Site, between these two ridges, is an area of relatively flat land, in which flows the Black Brook and Oxley Gutter.

13.4.11 Surface water run-off flows south from the northern ridge, towards the Black Brook. Surface water run-off from the central area of the Site drains to the Black Brook and Oxley Gutter. The southern part of the Site, south of the southern ridge, drains towards the Shortcliff Brook.

13.4.12 The discharge rate for the existing Site was calculated using the ICP SuDS method in WinDES Micro Drainage software. Details of the method and results are provided as part of the Flood Risk Assessment (FRA) in Appendix 13.1. The existing Site is predominantly undeveloped with only a few farm buildings and access routes. As such, the discharge rate for the existing Site has been approximated by the greenfield runoff rate based on generalised soil and permeability conditions for the 1 in 100 year storm event. This was calculated to be 8.44 l/s/ha for Q_{100} and 3.28 l/s/ha for Q_{BAR}.

Water Quality

13.4.13 The Black Brook is located within the River Basin Management Plan (RBMP) for the River Humber. The RBMP shows that the current ecological status of the Black Brook is 'Poor'. Information for Oxley Gutter and Shortcliff Brook is not given. In their response to the scoping report for the Development (dated 12th March 2014), the Environment Agency stated that the current status/potential for the Black Brook to be 'Poor', Oxley Gutter to be 'Poor' and the Shortcliff Brook to be 'Moderate'.

Water Resources

13.4.14 The water supply to the surrounding area and existing buildings on the Site is provided by Severn Trent Water (STW). STW's Water Resources Management Plan (WRMP, 2010) shows that the Site is located within the East Midlands Water Resource Zone (WRZ). This WRMP states that, at the end of 2019, this Zone the supply shortfall will be 35Ml/d and by the end of 2034/35 this will increase to 65Ml/d. Within the WRMP, only the WRZ covering the Birmingham area has a greater shortfall by either 2019 or 2034/35.

13.4.15 The FRMP outlines STW's strategy of addressing supply/demand balance in each Water Resource Zone. For the East Midlands WRZ, the strategy focuses on:

- Increasing the capacity of the Derwent Valley Aqueduct to deploy water from a number of existing treatment works;
- Continued leakage reduction and water efficiency activity to reduce the demand for water; and
- Implementing a targeted policy of compulsorily metering unmeasured households to increase the rate of meter penetration in the WRZ.

Sequential Test

13.4.16 The NPPF aims to ensure that flood risk is taken into account at all stages in the planning process, steering development towards low risk areas through the use of a sequential approach which avoids inappropriate development in areas at risk of flooding.

13.4.17 Local Planning Authorities are expected to allocate land for development based on a 'Sequential Test' which gives precedence to the development in Flood Zone 1. Only if no suitable areas are reasonably available within Flood Zone 1 is development within Flood Zone 2 or 3 acceptable. Further information in respect of the Sequential Test is set out within the FRA at Appendix 13.1.

Sequential Approach

13.4.18 As outlined in the PPG, a sequential approach should be taken when developing the Masterplan. This ensures that development is, as far as reasonably possible, located where the risk of flooding from all sources is lowest, taking account of climate change. As such, only essential infrastructure should be located in Flood Zones 2 and 3 and 'More Vulnerable' land uses, such as residential use, should be restricted to Flood Zone 1, as defined in the FRA.

Exception Test

13.4.19 The Development is mixed use including residential, commercial and recreational areas. The only developed areas within Flood Zone 2 or 3 are:

- Football pitch – classed as water-compatible development according to Table 2 of Planning Practice Guidance; and
- Road Access Bridge – classed as essential infrastructure according to Table 2 of Planning Practice Guidance.

13.4.20 Table 3 of the PPG shows that these uses are appropriate within all Flood Zones and should be design and constructed to: remain operation and safe for users in times of flood; result in no net loss of floodplain storage; and not impede water flows and not increase flood risk elsewhere. These requirements have been included as part of the FRA.

13.5 Assessment of Impacts, Mitigation and Residual Effect

13.5.1 The construction and operational phases of the Development could affect flood risk and the significant effects are described in the following sections.

Impact Assessment

Construction

Fluvial Flood Risk

13.5.2 The majority of the Site is located within Flood Zone 1 and, as such, is at a low risk of fluvial flooding. Due to the construction of a new access road bridge which crosses the Black Brook and of Site reprofiling and other associated works, some construction activities will inevitably take place in the floodplain of the Black Brook. The impact of such construction on floodplain storage capacity and conveyance will be moderate adverse prior to the incorporation of suitable mitigation measures.

Surface Water Flood Risk

13.5.3 During each phase of construction, the impermeable area of the Site will increase and surface water will be managed using a temporary drainage system. This has the potential to increase the risk of surface water flooding and to increase the flows in the watercourses on Site until the permanent drainage system is in operation. The potential effect on flood risk will be **minor adverse** prior to the incorporation of suitable mitigation measures.

Other Flood Risk

13.5.4 Impacts from other forms of flooding during the construction phase are considered to be **negligible** (even prior to mitigation measures being applied).

Water Quality

13.5.5 During earthworks and construction operations, there is potential for the on-site generation of surface water run-off contaminated with hydrocarbons from machinery, fuel storage or heavy vehicles parked on Site. In addition, fine particles may also originate from stockpiles of

construction materials, plant and wheel washing. Surface water runoff could potentially become silty during construction. This is considered to have potential **moderate adverse** effects on surface water quality.

13.5.6 The construction phase could affect groundwater beneath the Site through mobilisation of contaminants. A list of potential sources of contamination include:

- Fine water sprays from dust suppression techniques;
- Washings from vehicle wheel and body washing;
- Excavation or demolition activities; and
- Storage of chemicals and oils on Site and potential spillages.

This is considered to have potential **moderate adverse** effects prior to the implementation of mitigation measures.

Water Resources

13.5.7 Although there will be an increase in water demand during construction relating to construction activities, the potential effects on water availability to the surrounding area will be **negligible**.

Operation

13.5.8 The Development comprises residential and employment areas, a Community Hub, open space, Garendon Park and associated infrastructure. This will result in a large portion of the Site comprising of impermeable surfaces (buildings, hard standing, roads, etc.).The existing Garendon Park will not be modified significantly other than restoration works.

Fluvial Flood Risk

13.5.9 Other than essential infrastructure for the new access roads through the Site or for drainage connections to the watercourses and a water compatible football pitch, the development will be located in Flood Zone 1 and as such has a low probability of flooding.

13.5.10 The new access road bridge crosses the Black Brook and its floodplain. The impact on floodplain storage capacity and conveyance as a result of the operation of the Development will be **moderate adverse** in the long-term if no mitigation is provided.

Surface Water Flood Risk

13.5.11 The Development and surface water management strategy will result in changes to the current drainage regime but the scheme will be designed to ensure that discharge rates from Site to the receiving systems are restricted to the existing (baseline) Greenfield runoff rates.

13.5.12 The operation of the Development will result in an increase in the impermeable surfacing at the Site, which could pose a risk of flooding by increasing the potential peak rates of runoff within the Site and the rate at which surface water enters the receiving systems, potentially exacerbating the existing downstream flood risk issues. The impact on surface water flooding is expected to be **moderate adverse** in the long-term if no mitigation measures are put in place.

Other Flood Risk

13.5.13 Impacts from other forms of flooding during the operation phase are considered to be **negligible** (even prior to mitigation measures being applied).

Water Quality

13.5.14 Surfaces of roads and car parks may be prone to collect contaminants from vehicles such as oil, rubber and paint. After a storm, these contaminants could be washed off with no mitigation and potentially enter surface and groundwater systems. This is considered to have a potential **moderate adverse** effect with no mitigation.

Water Resources

13.5.15 Any additional demand on the resources has the potential to have a moderate to high magnitude of effect. As a precautionary measure this is considered to have a **moderate adverse** effect on water resource availability.

13.6 Mitigation

13.6.1 The measures proposed to mitigate the identified potential effects of the Development concerning flood risk and surface water, are discussed in this section with respect to both the construction and operational phases of the Development. Typically, the potential effects during the construction phase would be identified and controlled through the implementation of a Construction and Environmental Management Plan (CEMP) and appropriate Method Statements for all work on Site. Effects of the operational development are managed through design of the scheme, masterplanning and through ensuring best practice criteria in the SuDS design. Any residual impacts following implementation of the mitigation measures are identified in the Residual Impacts section.

Construction

Fluvial Flood Risk

13.6.2 Construction associated with the new road bridge and any other works in the floodplain will impact temporarily on floodplain utilisation. The following mitigation measures will be taken to minimise any impact on fluvial flood risk:

- No permanent construction will occur within the river channel;
- No storage of materials/plant within the floodplain;
- Works within the floodplain will be minimised as far as possible;
- Where necessary, works in the channel or floodplain will be managed through the relevant consenting process;
- EA Flood Warning Service will be used to inform construction work and any requirements for flood preparation;
- Evacuation and demobilisation plan will be written in order to move plant/materials out of the floodplain in the event of a flood warning/forecast; and

- Contractor will be expected to provide a method of works to cover the above.

Surface Water Flood Risk

13.6.3 A suitable drainage scheme will be required to control surface water runoff during the construction phase to ensure that any additional surface water runoff generated from the Site does not increase flood risk downstream. The scheme will be designed to manage surface water effectively on Site and to protect existing buildings and infrastructure. Details of this scheme will be developed as part of the CEMP.

Other Flood Risk

13.6.4 As impacts from other sources of flood risk are negligible, no mitigation is required.

Water Quality

13.6.5 Measures will be required to mitigate for the effects of contaminant migration during material excavation and removal and for the addition of contaminants through vehicle/plant use. Such measures will follow the pollution prevention guidelines issued by the EA and CIRIA (2001). These measures will include the appropriate use of temporary bunding and settlement ponds to allow for isolation and on-site treatment of any sediment laden or contaminated water prior to discharge to the drainage system.

13.6.6 Depending on the construction technique used, piled foundations, if required, have the potential to introduce new pathways for the migration of contamination of the ground or near-surface groundwater. To mitigate this risk the selection of pile types and the design and construction of piled foundations under areas of the Site with significant concentrations of potential contaminants will be carried out in accordance with the techniques given in the EA guidance on pollution prevention (EA, 2001). To this end, a piling risk assessment should be prepared in accordance with EA guidance for piling into contaminated Sites if further studies demonstrate that contaminations is present at the Site. If piling or deep foundations are adopted, consideration will also need to be made in relation to possible anthropogenic obstructions.

Water Resources

13.6.7 The potential effects of the construction phase on water resources will be negligible. However, the construction workers will be briefed to follow best practice in minimising water use and avoiding wastage during the works.

<u>Operation</u>

Fluvial Flood Risk

13.6.8 The FRA, including hydraulic modelling, reports on the assessment of potential impacts of the new road bridge on the floodplain. This shows that the bridge will impact flows in the floodplain for storm events of 1 in 100 year frequency and greater. Such effects are limited to within the Site and do not impact on flooding downstream of the Site.

13.6.9 To minimise the impact of the new road bridge on the floodplain the following design features have been incorporated:

- Soffit level of the bridge within the channel set at 600mm above the 100 year plus climate change flood level;
- Open span bridge with no permanent structures in the river channel;
- Flood relief culverts installed across the floodplain to maintain flood conveyance; and
- Floodplain storage compensation provided within the Site as detailed in the FRA.

13.6.10 The proposed surface water management strategy ensures that flows into all watercourses within the Site are maintained to existing runoff regimes.

Surface Water Flood Risk

13.6.11 An overall strategy for the surface water drainage at the Site has been developed as part of the FRA (within Appendix 13.1). The strategy includes the use of surface water attenuation measures and SuDS in line with NPPF, CBC and EA recommendations. To restrict discharge rates, surface water runoff will be stored on-site. Flows will be attenuated through the use of new attenuation ponds, swales and other SuDS features to be created as part of the Development.

13.6.12 To realise the widest benefits, the detailed design of strategies for managing surface water runoff will be considered in conjunction with the proposals for providing open space, green infrastructure, land reprofiling, SuDS measures, foul water treatment and potable water strategies.

13.6.13 Information from the British Geological Survey (BGS) Digital Geological map of Great Britain at 1:50,000 scale, included within the FRA, confirms that though parts of the Site are underlain by superficial deposits comprising sand, gravels and diamicton the whole Site is underlain by a bedrock geology of Mercian Mudstone (Gunthorpe Member of Sidmouth Mudstone Formation), as such, have a very low impermeability. Therefore use of soakaways or other infiltration features as a primary means of surface water run-off management are not considered appropriate for the Development. As such, the current strategy is for a managed discharge of surface water into the local watercourses with on-site attenuation provided primarily via above ground features.

13.6.14 Based on the proposed impermeable area, the FRA details the likely storage requirements for surface water runoff for the 1 in 100 year storm (plus a 30% allowance for climate change for all areas). The storage requirement has been established using the Q100 discharge rate. While lower order rainfall events will have a lower discharge rate this is considered to represent the worst case in terms of establishing the storage volume likely to be required. The final system will comprise flow control devices at the outlet of each attenuation basin such that the discharge for a given return period event is commensurate with the Greenfield runoff rate for that same event and not a fixed discharge rate.

13.6.15 At this outline stage a surface water management strategy has been developed which is made up of the following features:

- Use of SuDS features where feasible and cost effective;
- Attenuation basins with tiered hydrobrake flow control outlets to provide storage of surface water runoff for most catchments;

- Wetland features; and
- Linear features and swales to be included as appropriate, to provide storage of runoff and conveyance across the Site.

13.6.16 The indicative surface water management strategy is shown included in the FRA. It should be noted that this strategy is subject to the development of a detailed earthworks strategy for the Development and is therefore subject to refinement as the development proposals progress.

13.6.17 The indicative surface water management strategy outlines potential locations of attenuation ponds and sizes to store the 1 in 100 year + 30% climate change rainfall event, based on a maximum storage depth of 0.5 to1.5m and a minimum freeboard of 300 to 500mm. These attenuation ponds will be located within the open space network.

13.6.18 A conservative estimate of impermeable area (70% for residential areas, 80% for commercial areas) has been used to estimate the maximum attenuation volume required. These volumes have then been used to provide an outline size of the attenuation ponds, representing a robust assessment of attenuation storage at this stage. It is therefore considered that sufficient space can be made available for the attenuation ponds within the Development.

13.6.19 While the above indicative surface water management strategy and storage requirements consider the attenuation requirements for the 1 in 100 year plus climate change rainfall event, it should be noted that other SuDS features will be used within the Development such as swales, filter strips and permeable paving, which will provide a degree of further on-Site attenuation. The final strategy will be determined at the detailed design stage and will include a range of suitable SuDS.

13.6.20 As the Development progresses and there is further clarity on the layout within plot areas, plot levels and reprofiling across the Site, a strategy for managing overland flow will need to be defined. This will require the identification of specific areas for routing or storage of runoff for the more extreme events above the design storm. This strategy will include measures such as permeable paving and rainwater harvesting which may contribute to further water quality benefits. Ground levels will be designed so as to ensure that water is routed away from buildings and key access routes and towards areas such as car parking or public open space.

13.6.21 The long term maintenance and adoption of all SuDS features will need to be addressed as part of this strategy and it will be necessary to confirm the preference for this scheme. Under the Flood and Water Management Act secondary legislation will be brought forward to establish SuDS Approving Bodies (in this case Leicestershire County Council will take on the role of SAB) who will be responsible for adopting SuDS features that comply with the forthcoming National Standards. The timescale for this is uncertain, although it is anticipated that clear procedures will be implemented in the timescale for this development.

13.6.22 The final form of the SuDS features will be designed that side slopes, water depths and planting are sympathetic to the existing ecological context.

Other Flood Risk

13.6.23 As impacts from other sources of flood risk are negligible no mitigation is required.

Water Quality

13.6.24 In accordance with CIRIA 697 runoff from residential areas and residential roads will include two stages of treatment. Initial treatment will be provided in catch pits and trapped gullies as part of the conventional drainage network serving the site, which will act to remove sediment. The second stage of treatment will be provided by retention of surface water in the above ground SuDS features. The SuDS features will also act to filter surface water runoff to facilitate the further removal of sediment and pollutants.

13.6.25 Regarding the impact of foul water drainage on water quality, consultation with Severn Trent Water is underway to agree a suitable Foul Water Strategy for the Site. This will be implemented as part of the scheme.

Water Resources

13.6.26 Water efficiency measures will be built into the development to reduce the effect on the available water resources in line with Building Regulations. To reach this, measures such flow restrictors, efficient showers, toilet washing machines and dishwashers can be installed within the homes to reduce water usage. Rainwater collection can also be employed to reduce the need to use potable water.

13.7 Residual Effects

13.7.1 This section outlines the environmental effects that are predicted to remain after the incorporation of mitigation measures. Table 13.2 outlines the significance of these effects pre- and post-mitigation.

Construction

Fluvial Flood Risk

13.7.2 The impact of construction activities will be managed through a suitable mitigation strategy to ensure that impacts on floodplain storage and conveyance are minimised. With implementation of the mitigation measures, the residual effect on flood risk will be **minor adverse** at the local level.

Surface Water Flood Risk

13.7.3 Surface water runoff will be managed on Site through a suitable mitigation strategy at each stage of construction to ensure that discharges into the watercourses are restricted to appropriate rates. With implementation of the mitigation measures, the residual effect will be **negligible** at the local level.

Other Flood Risk

13.7.4 As the pre-mitigation impact from other flood risk is negligible, no mitigation is required and, as such, the residual effect is **negligible**.

Water Quality

13.7.5 With the implementation of the mitigation measures, the residual effect on surface water and groundwater quality from construction activities will be **negligible**.

Water resources

13.7.6 Best practice will be adopted to minimise the water demand during the construction phase, such that the residual effect will be **negligible**.

Operation

Fluvial Flood Risk

13.7.7 Fluvial flood risk is directly affected by the new road bridge across the Black Brook. Flows into all the watercourses within the Site will be managed to seek to maintain existing runoff regimes from the Site. With the proposed mitigation measures, the residual effect from fluvial flood risk is **negligible** in the long term.

Surface Water Flood Risk

13.7.8 Surface water runoff will be managed on Site through a suitable mitigation strategy which will be subject to a long term maintenance strategy to ensure that discharges into the watercourses are restricted to appropriate rates for the lifetime of the development. With implementation of the mitigation measures, the residual effect will be **negligible** in the long term at the local level.

13.7.9 As the system will be designed for the 'with climate change' scenario and discharge rates restricted to the existing Greenfield runoff rates, it is possible that the system will actually result in a **minor beneficial** effect in the medium term at the local level. The proposed surface water strategy will ensure that discharge rates from the Site are not increased in the receiving systems.

Other Flood Risk

13.7.10 As the pre-mitigation impact from other flood risk is negligible, no mitigation is required and, as such, the residual effect is **negligible**.

Water Quality

13.7.11 With the implementation of the mitigation measures, the residual effect on surface water and groundwater quality from operation of the development will be **negligible**.

13.7.12 The EA, in its response to the scoping request (dated 12th March 2014), stated that the current status of the Black Brook, Oxley Gutter and Shortcliff Brook is '*Poor'* due to the presence of phosphates. By reducing the areas of agricultural use at the Site and introducing a managed regime for surface water runoff this will reduce fertiliser use and any related runoff into the watercourses and, therefore, will potentially provide a **minor benefit** locally in water quality.

Water Resources

13.7.13 The availability of water resources has not been confirmed at this stage. However, the deployment of water efficiency technologies will reduce the residual effect on water resources to **minor adverse**.

Table 13.2 Summary of Effects

Potential Effect	Significance	Mitigation Measures	Significance of Residual Effect
Construction			
Fluvial Flood Risk	Moderate Adverse	No storage of materials/plant in floodplain. Evacuation/demobilisation plan. Flood warning alerts. Minimise works within the floodplain.	Minor Adverse
Surface Water Flood Risk	Minor Adverse	Surface water drainage regime – part of CEMP.	Negligible
Other Flood Risk	Negligible	Not required.	Negligible
Water Quality	Moderate Adverse	Pollution Prevention Guidance/CIRIA 2001. Bunding/settlement ponds. Piling Risk Assessment	Negligible
Water Resources	Negligible	Minimise water use. Construction worker briefings.	Negligible
Operation			
Fluvial Flood Risk	Moderate Adverse	Bridge designed so no impedance of flood flows. Floodplain storage compensation. FRA/Surface water management strategy.	Negligible
Surface Water Flood Risk	Moderate Adverse	Surface water management strategy/SuDS.	Negligible/Minor Beneficial
Other Flood Risk	Negligible	Not required.	Negligible
Water Quality	Moderate Adverse	CIRIA 697. SuDS.	Negligible/Minor Beneficial
Water Resources	Moderate Adverse	Water efficiency measures. Rainwater collection and use.	Minor Adverse

13.8 Cumulative Impacts

13.8.1 The following schemes were considered for any cumulative impacts associated with the Development:

- Loughborough University Science and Enterprise Park;
- Biffa Waste Incinerator Scheme;
- Dishley Grange Employment; and
- Off-Site highway improvements/Ashby Road widening.

13.8.2 The Loughborough University, Biffa Waste and highway improvement/Ashby Road widening Sites are located south of the Development along Ashby Road that borders the Site. The surface water from these Sites will drain to either the Shortcliffe Brook (that passes through the Site) or to a tributary of the Burleigh Brook (downstream of the Site). However, given that these schemes must comply with requirements outlined in NPPF, specifically to not increase flood risk either at the Site or elsewhere, it is considered that they will not have any cumulative impact on the Development.

13.8.3 The Dishley Grange Site is located north of the Development and the surface water from this Site will drain into the River Soar to the north and, therefore, will have no cumulative impact on the Development.

13.9 Summary

13.9.1 The effects of the Development with regard to flood risk, water quality and water resources has been assessed for both the construction and operation phases of the Development. The implementation of mitigation measures outlined above will reduce any residual effects of and by the Development Site to Negligible/Minor Adverse. The implementation of the proposed surface water management strategy, as detailed in the FRA (Appendix 13.1), will potentially bring a Minor Beneficial effect.

14 GEOLOGY AND GROUND CONDITIONS

14.1 Introduction

14.1.1 Land Research Associates have been appointed to undertake an assessment of the environmental effects of the Development with respect to agriculture and soil resources. This Chapter explains the assessment and forecasting methodology and sets out the chosen evaluation criteria. The format follows a standard study pattern by summarising relevant planning policy, describing the baseline conditions, describing the relevant design features and then assessing the likely significant effects.

14.1.2 In addition to the assessment with respect to agriculture and soil resources, at the request of Charnwood Borough Council, an assessment for mineral deposits within the Site was also carried out by Wardell Armstrong.

14.1.3 The majority of the Site is in agricultural use, mainly arable production but with some grassland used for horse livery. Agriculture will consequently be a receptor of potential effects arising from the Development.

14.1.4 The soil within the Site is otherwise largely undisturbed and acts as a filter to attenuate and immobilise substances falling on it, regulates rainfall movement to surface water and groundwater and supports ecological habitats and biodiversity. The sustainable management of soil and land is a central pillar in sustainable development and, consequently, any effects on soil will also be important.

14.1.5 This Chapter should be read in conjunction with Appendix 14.1: Soil Resources and Agricultural Use & Quality of Land West of Loughborough, Leicestershire and Appendix 14.2 Minerals Desk Study.

14.2 Study area

14.2.1 Apart from scattered areas of woodland, all of the Site is currently in agricultural use. However, a significant area of it will remain undisturbed and used for reinstatement of Garendon Park. This land was excluded from the study.

14.2.2 The northern part of the Site lies within a Sand and Gravel Mineral Consultation Area (MCA). This is shown edged purple on Figure 14.4. The southern western extremity of the Site, adjacent to Junction 23 of the M1, lies within an Igneous Rock MCA.

14.3 Policy framework

14.3.1 National planning guidance relating to agriculture and soils is in the NPPF which states at paragraph 112 that:

> *"Local planning authorities should take into account the economic and other benefits of the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification). Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality."*

14.3.2 Paragraph 109 of the NPPF states that:

> *"The planning system should contribute to and enhance the natural and local environment by … protecting and enhancing valued landscapes, geological conservation interests and soils' and 'preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability*."

14.3.3 A 2007 Environment Agency document, *Soil a Precious Resource: Our strategy for protecting, managing and restoring soil* has complementary aims, including encouraging the construction industry to re-use soils to reduce the amount disposed of as waste, and reducing flood risk and pressures on urban drainage.

14.3.4 The PPG sets out at Paragraph 002 (reference ID: 27-002-20140306) that:

> *"Since minerals are a non-reusable resource, minerals safeguarding is the process of ensuring that non-mineral development does not needlessly prevent the future extraction of minerals resources of local and national importance."*

14.3.5 The NPPF states that *'Minerals are essential to support sustainable economic growth and our quality of life'* (Paragraph 142). It continues to state that, '*since minerals are a finite natural resource, and can only be worked where they are found, it is important to make best use of them to secure their long term conservation.'* The need to safeguard valuable mineral resources is recognised in paragraph 143 of the NPPF.

14.3.6 The Saved policy ST/1 of the Borough of Charnwood Local Plan 2004 states as an overall strategy that '*Measures will be taken to:.... ensure that considerable weight is given to the protection of best and most versatile land, which represents a national resource*.'

14.3.7 The Leicestershire Minerals Development Framework Core Strategy notes that development should respond to Minerals Safeguarding Policies. Those policies are policies MDC8 and MDC9 of the Leicestershire Minerals Core Strategy and Development Control Policies DPD.

14.3.8 Policy MDC8 provides for the safeguarding of mineral resources. In broad terms, it states that planning permission will not be granted for development in a Mineral Safeguarding Area that is incompatible with safeguarding the mineral unless the mineral is of no value, or it can be extracted beforehand, or the incompatible development is temporary or of an overriding nature, or it is exempt development. Policy MDC9 provides for prior extraction to take place where appropriate.

14.4 Methodology

14.4.1 Details of the agricultural businesses that would be affected by the Development were identified by interview with the main users. The interview covered issues such as land tenure, stocking and cropping practices, farm staffing, entry of land into schemes such as environmental stewardship, and the use of land outside of the Site.

14.4.2 Agricultural land quality and soil resources were accurately assessed by means of a desk study of agricultural climate and a detailed survey involving observations of soil and land characteristics at the alternate intersects of a 100m grid. This work is described more fully in a separate technical report (Appendix 14.1). Using the Revised Guidelines and Criteria for Grading the

Quality of Agricultural Land, published by MAFF in 1988, each observation point was assigned a land grade and the classification of land at each location was then translated into maps of land grades and soil resources with the help of ground observations during the survey.

14.4.3 Other relevant baseline data was obtained from the publications detailed in the relevant paragraphs below.

Significance criteria

14.4.4 There is no nationally agreed scheme for classifying the effects of development on agriculture or soils, and the approach used in this Chapter has been developed over a number of years. Effects of a project can be adverse, causing significant negative effects on a receptor, beneficial, resulting in advantageous or positive effects on a receptor, or negligible.

Magnitude of the impacts

14.4.5 Under current planning policy, both local farm businesses and soil are considered to be of 'medium' sensitivity in terms of the national interest. Best and most versatile agricultural land (i.e. grades 1, 2 & 3a on MAFF's 1988 Agricultural Land Classification system) is considered to be a finite national resource, is given special consideration in national policy, and can be considered to be of higher sensitivity than land in grades 3b, 4 and 5. The actual sensitivity category assigned will vary regionally. In areas where best and most versatile land is not uncommon, grade 1 and 2 land can be considered to be of high sensitivity, sub-grade 3a of medium sensitivity, sub-grade 3b and grades 4 and 5 of low sensitivity. In areas of the country with little best and most versatile land, sub-grade 3a might be of high sensitivity and sub-grade 3b of moderate sensitivity.

14.4.6 The magnitude of impact on best and most versatile land will depend on the amount to be taken by the Development. Article 16, Schedule 5 of the Town and Country Planning (Development Management Procedure) (England) Order 2010 only requires Natural England to be consulted (on behalf of the Secretary of State for the Environment, Food and Rural Affairs) on development that involves the loss of not less than 20 ha of grades 1, 2 or 3a agricultural land. Consequently, the loss of areas smaller than this threshold is considered to have very low magnitude impact on the national stock of best and most versatile land. Losses of over 80 ha of best and most versatile land are equivalent to the size of a medium farm and are considered to be of high impact. The judgment-based classification adopted for impact on best and most versatile land is given in Table 14.1 below:

14.4.7 In considering the magnitude of the effect on farm businesses it is necessary to consider what proportion of the land utilised by the business will be taken by the Development, whether the farm will remain a viable business after the Development is complete, and how much restructuring might be necessary as a result of the Development. Table 14.1 gives examples of adverse effects of different magnitude.

14.4.8 Assessing the effects on soil is complicated as it is a multi-functional resource that provides a range of ecosystem services. These include physical support and nutrient cycling for plants, moderation of the hydrological cycle, providing a habitat and gene pool, and disposal of wastes and dead organic matter. A provisional classification is included in Table 14.1.

Table 14.1: Magnitude of Effects on the Three Receptors

Magnitude of effect	Agricultural land	Agricultural businesses	Soil ecosystem services
Large	Irreversible loss of >80 ha of best and most versatile land providing that the use of such land is not compromised by being distributed in a complex pattern with poorer land	Full-time farm business rendered unworkable and unviable. The farmer will have to seek alternative means of income.	Loss or irreversible damage to all topsoil resources. Sealing[1] of more than 75% of the soils within the Site.
Moderate	Irreversible loss of 20-80 ha of best and most versatile land	Reduction in net farm income requiring such that substantial restructuring is required.	Loss or irreversible damage to at least 50% of topsoil resources. Sealing of 50-75% of the soils
Small	Irreversible loss of 5-20 ha of best and most versatile land	Reduction in net farm income such that only minor restructuring is necessary.	Beneficial re-use of all or nearly all good quality topsoil resources[2]. Sealing of <50% of the soils within the site.
Negligible	Irreversible loss of <5 ha of best and most versatile land	Minimal effects, such as changed field accesses, not necessitating farm restructuring	Only minor disturbance of soils within the Site, with minimal surface sealing

[1] as by impermeable surfaces or through over-compaction of exposed soils

[2] defined for this purpose as undamaged light or medium loamy or silty topsoils

Sensitivity of Receptors

14.4.9 Best and most versatile agricultural land (i.e. grades 1, 2 & 3a on MAFF's 1988 Agricultural Land Classification system) is considered to be a finite national resource, is given special consideration in national policy, and can be considered to be of higher sensitivity than land in grades 3b, 4 and 5. The actual sensitivity category assigned will vary regionally. In areas where best and most versatile land is not uncommon, such as in the Loughborough area, grade 1 and 2 land can be considered to be of high sensitivity, sub-grade 3a of medium sensitivity, sub-grade 3b and grades 4 and 5 of low sensitivity. In areas of the country with little best and most versatile land, sub-grade 3a might be of high sensitivity and sub-grade 3b of moderate sensitivity.

14.4.10 Where land is contract-farmed or farmed through a tenancy arrangement without long-term security of tenure and without a long-term history of occupying that land, then the sensitivity to loss of use of that land is deemed to be low, because the right of the tenant or contractor to farm the land could cease, with agreed notice, at any time. Conversely, a farm business occupied by a long-term agricultural tenant is likely to be highly sensitive to change. Economic benefits from sale of agricultural land for development might also influence perceived and actual sensitivity (Table 14.2).

14.4.11 Assessing the sensitivity of soils is more complicated as soil is a multi-functional resource that provides a range of ecosystem services. These include physical support and nutrient cycling for plants, moderation of the hydrological cycle, providing a habitat and gene pool, and disposal of wastes and dead organic matter. For example, permeable loamy soils capable of absorbing

heavy rainfall and attenuating flooding, or supporting valued habitats will be more sensitive than impermeable clay soils used for intensive arable monoculture.

Table 14.2: Sensitivity of the Three Receptors

Sensitivity	Agricultural land in the Loughborough area	Agricultural businesses	Soil ecosystem services
High	Grades 1 & 2	Long-term Agricultural Holdings Act tenant	Permeable loamy soils providing a broad range of ecosystem services, or supporting valuable habitats
Medium	Sub-grade 3a	Mixed business farming some owned land and some medium- or short-term rented land	A mixture of soils, none of them supporting valuable habitats
Low	Sub-grade 3b and grades 4 & 5	Full time owner-occupied farm business that will gain sufficiently from sale of land to be economically unaffected OR agricultural user on a short-term tenancy or licence	Slowly permeable, damaged or contaminated soils providing a limited range of ecosystem services.

Significance of effects

14.4.12 The significance of any beneficial or adverse effect can be assessed as either 'major' or 'moderate' (i.e. significant)', 'minor' or 'negligible' according to the magnitude of the effect of the Development and the sensitivity of the receptor, as set out in Table 14.3 below.

Table 14.3 Significance of Impacts

Magnitude of impact	Sensitivity of Receptor		
	High	**Medium**	**Low**
Large	Substantial	Substantial	Moderate
Moderate	Substantial	Moderate	Moderate
Small	Moderate	Minor	Minor
Negligible	Minor	Negligible	Negligible

Uncertainties and limitations

14.4.13 There are no published or widely accepted assessment criteria for effects on farm businesses, best and most versatile land or soil resources, but we believe that the assessment criteria used are well founded.

14.5 Baseline Conditions

Agricultural use

14.5.1 Most of the Site is owned by the Garendon Park Estate and contract-farmed on behalf of the Estate farm – Garendon Park Farms. In addition, the northern part of the Site includes:

- Bedlam Barn Farm, Hathern, occupied by a tenant of the Estate;
- a large field between Pear Tree Lane and Hathern Drive, farmed by a tenant of the Estate-owned Dishley Grange Farm, Loughborough;
- two fields of Council-owned land, farmed from Whitwick;
- part of a block of five fields of contract-farmed locally-owned land against Shepshed Road, Hathern; and
- a small portion of a field farmed by Oakley Grange Farm, also a tenant of the Estate.

14.5.2 The farming layout is shown in Figure 14.1.

Garendon Park Farms

14.5.3 This is a mainly arable farming business of 842ha with sporting interests, with land within the application area, between the M1 motorway and Shepshed, to the west of Shepshed and with smaller outlying blocks around Moult Hill and to the south of Charnwood Quarry. All of the land is contract-farmed from Blackbrook Farm by Sentry on a four year arable rotation of two crops of winter wheat, one winter oilseed rape and a spring break crop of beans, linseed or sugar beet, depending on soil type. There are also blocks of maize grown to provide game feed and cover. The land is covered by an Entry Level plus Higher Level Environmental Stewardship scheme. Approximately 190ha of the farm's land is within the main Site.

Bedlam Barn Farm

14.5.4 Bedlam Barn Farm covers 56ha, let on an Agricultural Holdings Act tenancy and occupied by the second generation of a farming family. It is a mixed farm with arable land, and grassland beside the farm and Black Brook serving a 24 horse livery business. The arable land is now contract-farmed, mainly growing winter wheat for sale off the farm. It is all registered in Entry Level Environmental Stewardship and the whole farm is within the Site.

Dishley Grange Farm

14.5.5 Dishley Grange Farm is a 240ha mixed Estate-owned farm which lies to the north-east of the A6(T), extending down to the River Soar. It is an historic holding associated with the pioneer sheep breeder Robert Bakewell. The land is covered by an Entry Level plus Higher Level Environmental Stewardship scheme. Just over 24ha of arable land is within the Site, representing 10% of the total farm area.

County Council land

14.5.6 To the north of Bedlam Barn Farm are two fields (6ha) within the Site that forms part of County Council-owned farmland that is farmed from Whitwick on a farm business tenancy.

Shepshed Road, Hathern farmland

14.5.7 Alongside Shepshed Road, Hathern are five locally-owned fields totalling 13ha and let on a farm business tenancy to Sentry who farm them in a four year arable rotation. Two of the fields and most of a third field are within the Site.

Oakley Grange Farm

14.5.8 This is an organically-farmed Estate-owned farm of 220ha, occupied by a tenant. Only a very small part of one large field is within the Site.

Minerals

Superficial deposits

14.5.9 The geology of the northern part of the Site is shown on Figure 14.4, which is an extract from 1:10,000 geological plan numbers SK42SE and SK52SW published by the British Geological Survey (BGS). Superficial deposits occur in discontinuous patches over the Site and in narrow strips across the northern, central and southern areas of the Site. The superficial deposits that are within the Sand and Gravel MCA are shown on Figure 14.4. The most widespread deposit is the Wanlip Sand and Gravel Member, shown coloured orange on Figure 14.4. This is a river terrace deposit described on the BGS website as sand and gravel with minor clay silt lenses. It is considered that this deposit is likely to be of low quality and too thin to be viable for extraction. In addition, part of this deposit is sterilised by a water treatment works. For these reasons this deposit is considered to be of no commercial use or value.

14.5.10 Alluvium, comprising clay, silt, sand and gravel runs in three strips across the northern, central and southern parts of the Site. The northern strip lies within the Sand and Gravel MCA as shown coloured yellow on Figure 14.4. The deposit is adjacent to the Black Brook and marks the route of an ancient water course. The Alluvium is of no commercial use or value.

14.5.11 The third superficial deposit that is found within the Sand and Gravel MCA is Head, comprising clay, silt, sand and gravel, as shown on Figure 14.4. It is described in the BGS Lexicon as "*poorly sorted and poorly stratified deposits formed mostly by solifluction and/or hillwash and soil creep. Essentially comprises sand and gravel, locally with lenses of silt, clay or peat and organic material."* The description of this material shows that it is not suitable for use as an aggregate.

Solid geology

14.5.12 The solid geology of the entire Site beneath the superficial deposits is the Gunthorpe Mudstone Member, part of the Mercia Mudstone series, a sedimentary bedrock formed during the Triassic Period. Some parts of the Mercia Mudstone have been used for brickmaking in the past but it is rarely used for that purpose today, and it is a very common rock type with no other use. It is not regarded as being of any commercial use or value today.

Soils

14.5.13 The National Soil Map[9] shows a relatively complex soil pattern. South of the Black Brook the land is in Whimple and Dunnington Heath soil associations, comprising reddish fine and coarse loamy soils with slowly permeable subsoils and variable degrees of seasonally waterlogging. Some land is also in Brockhurst 3 soil association, which has reddish fine loamy over clayey slowly

[9] Ragg, J M (*et al)* 1984. *Soils and their Use in Midland and Western England* Soil Survey of England and Wales Bulletin No. 12

permeable soils, some developed in alluvium. The Black Brook itself is flanked by clayey, fine silty and fine loamy soils affected by groundwater. North of the brook the land is shown as Worcester soil association, comprising reddish clayey soils over mudstone, and Salop soil association with similar soils developed in reddish till.

14.5.14 The 156 soil observations carried out by the survey undertaken in November 2013 confirm the general soil pattern described by the National Soil Map. The pattern is relatively complex, but the soils were found to be of two main types – medium or heavy textured soils over reddish or greyish clay, and lighter-textured medium loamy or sandy soils.

14.5.15 The heavy soils are either predominantly grey in colour when developed in alluvium on lower-lying flattish land, or dominantly red when developed over mudstone or in glacial drift on slopes and plateaux. The topsoil is heavy clay loam or clay, and on the reddish soils has a small content of small quartzite stones derived from the drift on higher land. The subsoil is clay and red or grey in colour often showing paler mottle colours or ochreous mottles. In the red soils the subsoil either continues to depth or passes to brown crumbly mudstone. In some soils this is very close to the surface. Also common in the soils over mudstone are bands of sandstone “skerry”, either heavily weathered or dense and hard. In the greyer soils developed in alluvium the subsoil is mainly clay to depth, but can locally pass to sand or gravel below. The soils are seasonally waterlogged for differing periods due to water ponding over slowly permeable clay subsoil (wetness class III). They support a relatively narrow range of food and fibre production, and in arable use are more suitable for autumn sown crops. They have a poor capacity to absorb excess winter rainfall which tends to run off downslope, but a good capacity to absorb or attenuate pollutants falling on the soil surface. They provide moist, neutral habitats for plant communities.

14.5.16 Loamy soils are more common on higher ground particularly in the north-east and on foot-slopes and terraces in the centre of the Site, where drift deposits occur. The topsoil is sandy clay loam, medium clay loam, or medium sandy loam, often stony. The upper subsoil is sandy clay loam or medium sandy loam, brown in colour with more or less ochreous mottling depending on the underlying layers. The lower subsoil is usually slowly permeable reddish clay, and this occurs at depths varying between 50 and 100cm from the surface. The slowly permeable clay is absent in some localities. The soils suffer slight to moderate seasonal wetness caused by water ponding over underlying clay layers at various depths (wetness classes II or III). They support a wide range of food and fibre production, and they have a good capacity to absorb excess winter rainfall and absorb or attenuate pollutants falling on the soil surface. They provide moist, neutral habitats for plant communities.

14.5.17 The soils are described more fully in Appendix 14.1. Their distribution is shown in Figure 14.2.

Agricultural land quality

14.5.18 The soil types described in the previous section were used in conjunction with the agroclimatic data to classify the site using the revised guidelines for agricultural land classification issued in 1988 by the Ministry of Agriculture, Fisheries and Food[10]. Land of grades 2 and 3 has been mapped as shown in Figure 14.3.

14.5.19 Grade 2 land occurs where the soils are deep loams with no slowly permeable layers within 60cm. Slight seasonal wetness may limit workability in the late autumn and early spring, and stony topsoils can cause machinery wear and disrupt seed placement during cultivation.

14.5.20 Sub-grade 3a land occurs on soils with loamy upper layers over slowly permeable clay within 60cm depth. In some the clay lies directly below loamy topsoils. The principal agricultural limitation is moderate seasonal wetness caused by water ponding over heavy subsoils.

14.5.21 Sub-grade 3b is the dominant land quality where heavy topsoil is directly over slowly permeable clay subsoil, and seasonal wetness (wetness class III or IV) is the principal limitation. Close to streams groundwater also causes wetness.

14.5.22 The boundaries between the different grades of land are shown on Figure 14.3 and the areas occupied by each are shown below.

Table 14.4 Areas occupied by the Different Land Grades

Grade/sub-grade	Area (ha)	% of agricultural land	% of total land
Grade 2	38.3	15	14
Sub-grade 3a	104.0	41	38
Sub-grade 3b	110.3	44	41
Other land	18.5		7
Total*	271.1	100	100

*Excludes the southern part of the Site which is to be partly used for reinstatement of the historic parkland and remain undeveloped.

14.6 Potential impacts

14.6.1 The northern part of the Site lies within a Sand and Gravel Mineral Consultation Area (MCA). The geology of the Site demonstrates that the superficial deposits are not materials which are suitable for extraction and use. The sand and gravel deposits are confined to the narrow alluvial plain of the Black Brook and the adjacent poorly defined low terraces, where the deposits are thin and of low quality. It is considered therefore that they would not represent viable potential aggregate-

[10] *Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*. MAFF, 1988.

bearing deposits, therefore the Development will have no adverse impact on potentially viable resources.

14.6.2 The southern western extremity of the Site, adjacent to Junction 23 of the M1, lies within an Igneous Rock MCA. This corresponds with a 500 meter buffer zone around Charnwood Quarry. The Development is unlikely to have an adverse effect on any remaining mineral resources at this quarry.

14.6.3 As a consequence, it is considered that the superficial deposits on the Site do not constitute potential aggregate minerals, and the underlying mudstone is not regarded as being of any commercial use or value today. Consequently, it is concluded that built development on this Site would not cause the sterilisation of any minerals and the loss of potential resources.

Construction phase

14.6.4 The Development will progress in a number of phases and, consequently, the potential impacts on agriculture and soils will be gradual and progressive over the life of the project.

Agricultural use

14.6.5 The Development will progressively remove up to 275ha of land from agricultural use, most of which is arable land.

14.6.6 This will include all of the land (48ha) of Bedlam Barn Farm but the farm buildings will be retained. This will allow the livery business to continue in its current form until about 2023. The horse grazing field to the west of the buildings could be taken for development by that time, necessitating some adjustment to the livery business.

14.6.7 It will also remove 25ha of Dishley Grange Farm (10% of the holding) in the first phases of the Development. The land taken is of best and most versatile quality and represents some of the better land of the farm.

14.6.8 Three other farm units will also be taken between Shepshed Road and the A6(T) - 6ha of Charnwood Borough Council land, 8ha from a small agricultural holding alongside Shepshed Road and almost 2ha from a large field farmed by Oakley Grange Farm.

14.6.9 The remaining 160ha of agricultural land, most of which is in arable use, within the construction area is the land of Garendon Park Farms and, if all removed from agricultural use, will represent about almost 20% of the holding. The land is owned by the Garendon Estate which will benefit from its sale for development but will represent a loss of turnover to Sentry Farming which contract-farms 842 ha of the estate as well as smaller blocks of land in the locality, such as at Osbaston, Charley Knoll and Hathern. However, some fields beside the Black Brook could remain available for arable use.

14.6.10 187 ha of land (the Registered Parkland) in the south and south-east of the Site , of which 118ha is in arable use, will remain undisturbed apart from construction of a link road in the south west corner. Re-establishment of tree avenues radiating from the Temple of Venus, with grassland established between the avenues will potentially remove 65 ha of this land from arable use. The potential total loss of arable land to the contract-farming company could reach 250ha, more than a quarter of the land it currently farms.

Agricultural land quality

14.6.11 The Development will progressively remove 142ha of best and most versatile land in grade 2 and sub-grade 3a from use, which would normally be a substantial adverse impact. However, the poorer sub-grade 3b land and the best and most versatile land are in a complex pattern whereby both categories are present in many fields with the sub-grade 3b land controlling use. Consequently the adverse impact is considered to be moderate overall. Agricultural land quality within the Registered Parkland to the south will not be affected apart from an 8ha loss to the Strategic Link Road and associated landscaping.

Soils

14.6.12 Construction will involve the progressive stripping of topsoils from development phases, storing them for future use, and using them to create structural landscaping and amenity areas. Loss of valuable soil resources can occur if topsoils are not first stripped from areas to be disturbed and topsoil quality will deteriorate if moved when wet. Over-compaction of subsoil as a result of trafficking by construction vehicles over ground to be used for gardens or landscaping not only affects the performance and visual quality of vegetated areas but also affects hydrology. Part of the site has permeable topsoil and subsoil but over-compaction by construction vehicles can severely reduce the permeability of these layers and their capacity to absorb excess rainfall. The consequence is an increase in run-off. Over-compaction also restricts the depth to which plant roots can proliferate. This reduces soil moisture deficits in summer so that moisture repletion occurs sooner in autumn, further exacerbating the soil's ability to absorb excess rainfall. The consequence is increased hydraulic and sediment loadings to watercourses and an increased risk of flooding.

14.6.13 Given that around 136 ha (28%) of the development is to be built environment the significance of the impact is minor adverse. The impact on soil functions are summarised in Table 14.5.

Table 14.5 Impacts of the Development on the Main Soil Functions

Soil or land function	Impacts of the proposed land uses	
	Built environment	**Landscape and amenity land**
Landscape support	Mainly moderate adverse	Neutral
Food and fibre production	Major adverse	Major adverse
Transformation and buffering	Moderate adverse	Minor adverse
Supporting habitats/biodiversity	Moderate adverse	Minor beneficial
Storing and transmitting water	Moderate adverse	Neutral

Cumulative impacts

14.6.14 A number of other developments proposals have been set out in the Submission Draft version of the Borough of Charnwood Local Plan Core Strategy. These include significant residential developments east of Loughborough, west of Shepshed, north of Birstall, and north east Leicester as well as smaller developments on the fringes of Loughborough and Shepshed.

Garendon Park Farms land is involved in some of these, but there is unlikely to be any increased impact on the contract farming operation as a result.

Operational phase

14.6.15 Once the Development has been completed the main effects will be established, although there could be ongoing issues caused by new urban population trespassing onto neighbouring agricultural land.

14.7 Mitigation and Enhancement

Agricultural use

14.7.1 The loss of agricultural land cannot be mitigated. Some land is designated to remain in agriculture including re-established parkland in Garendon Park, and floodplain land alongside the Black Brook. Some of the latter is used as grassland by Bedlam Hall Farm and if retained for this use will offset the short-term impact on the farm. Parkland in Garendon Park may be grazed and mown for conservation.

14.7.2 No mitigation is possible for the loss of land from the Dishley Grange agricultural business.

14.7.3 During construction, which will be phased over a long period, access to all available land will be maintained to allow agricultural use to continue.

Agricultural land quality

14.7.4 Apart from 8ha likely to be lost to the Strategic Link Road and associated landscaping, the land to be restored to parkland at Garendon Park will not be disturbed and will retain its agricultural potential. Within the Site some land will also remain undisturbed such as that on the floodplain of the Black Brook of moderate quality in sub-grade 3b. The land designated for hard development contains nearly all of the best and most versatile land on the Site, and no mitigation is possible for its loss.

Soils

14.7.5 The Defra Construction Code of Practice for Sustainable Use of Soils on Construction Sites (2009) provides guidance on good practice in soil handling as part of a Materials Management Plan and Site Waste Management Plan. Soil management to be employed on the project to include:

- Avoidance of traffic in areas that do not need to be disturbed;
- Careful stripping of topsoil (using suitable soil-handling equipment) from areas to be disturbed, ensuring no mixing with the subsoil;
- Storing soils in temporary low stockpiles, protected from contamination by other materials and sown with grass if being stored for more than 6 months;
- Spreading topsoil only onto subsoil that has been de-compacted; and
- Using any surplus topsoil beneficially elsewhere.

14.7.6 These measures, and the soil and land functions that they are designed to protect, are summarised in Table 14.6 below.

Table 14.6: Mitigation measures to avoid or reduce the main effects of construction on soil and land functions

Soil/land function	Design measure
Landscape support	Retention of stripped topsoil. Minimising soil compaction in landscaped areas. Avoidance of traffic on undisturbed areas
Food and fibre production	None possible in disturbed land
Transformation and buffering	Maximising use of porous surfaces. Minimising soil compaction
Supporting habitats/biodiversity	Minimising soil compaction in landscaped areas. Avoidance of traffic on undisturbed areas. Provision of a range of biodiversity features within landscape areas.
Storing and transmitting water	Maximising use of porous surfaces. Minimising soil compaction in landscaped areas

14.8 Residual impacts

14.8.1 The impact on Dishley Grange Farm remains moderate adverse, as no mitigation is possible for the loss of the land early in the Development Phases. The gradual loss of Bedlam Hall Farm's arable land will be partly mitigated by retention of the farm buildings and some grazing land, allowing the livery business to continue in its current form for at least 10 years, a moderate adverse impact overall.

14.8.2 The loss of the arable land will build up to become a moderate impact on the contract-farming business that operates Garendon Park Farms, although the sale of the land for development will financially benefit the Garendon Estate, perhaps allowing for the purchase of further farmland.

14.8.3 Implementation of the soil conservation policies will result in a minor adverse residual impact on the soils with landscape areas and public open space but a moderate to major impact on soils sealed by buildings and hard surfaces.

14.8.4 The loss of 142 ha of best and most versatile land in grades 2 and 3a (30% of the entire site), would be a moderate adverse effect on such land in the County as described above.

14.8.5 It is considered that there will be no residual impact on mineral deposits on the Site as superficial deposits on the Site are not suitable for use as an aggregate, and the underlying mudstone is not regarded as being of any commercial use or value.

14.9 Summary

14.9.1 The impact of the Development on agricultural and soils has been assessed for both the construction and operation phases of the Development. The Development would involve the loss of approximately 142ha of best and most versatile agricultural land (30% of the land area), which cannot be mitigated, a significant adverse effect on such land in the county. However, the poorer sub-grade 3b land and the best and most versatile land are in a complex pattern whereby both

categories are present in many fields with the sub-grade 3b land controlling use. Consequently the adverse impact is considered to be moderate overall.

14.9.2 The loss of agricultural land farmed under tenancy or contract would represent a moderate adverse impact on the farm businesses during the operational phase. The impact of construction on soil resources is expected to be minor given that soil function will be retained over the majority of the site (unbuilt areas). There is no potential for impacts on minerals on the Site.

15 ALTERNATIVES

15.1 Introduction

15.1.1 This Chapter has been prepared by RPS Planning & Development (Planning).

15.1.2 The EIA Regulations (Schedule 4, Part1) stipulate that the ES must include an outline of the main alternatives studied by the applicant and an indication of the main reasons for the choices, taking into account the environmental effects.

15.1.3 The EIA Guide to Procedures (paragraph 33) makes it clear that appropriate consideration of alternative sites is a material consideration in the assessment of the ES and thereby the determination of the planning application:

> ***"It should be noted that developers are now required to include in the environmental statement an outline of the main alternative approaches to the proposed development that they may have considered, and the main reasons for their choice. It is widely regarded as good practice to consider alternatives, as it results in a more robust application for planning permission. Also, the nature of certain developments and their location may make the consideration of alternatives a material consideration. Where alternatives are considered, the main ones must be outlined in the environmental statement."***

15.1.4 Whilst the term main alternative is not defined in the Regulations, it is for the ES to determine the main alternatives and how these have been considered.

15.2 The Study Area

15.2.1 The Development represents a major urban extension to Loughborough Town that has been considered through an extensive Development Plan process, which has considered all reasonable alternatives to both the provision of urban extensions, and alternative locations for their allocation.

15.2.2 The Council's evidence base (particularly the Council's updated Sustainability Appraisal Update prepared for the Examination) has identified the SUE to the West of Loughborough as a longstanding preferred approach in the Council's consideration of the most appropriate manner to provide for the housing and employment needs of the Borough, and Loughborough itself. Decisions on this by the Council have been undertaken in full consideration of alternative strategic options and alternative SUE locations. As such, the Core Strategy with the allocation of a SUE at West of Loughborough for approximately 3,000 dwellings, as submitted to the Examination, represents a sound and robust basis for planning the future of the Borough given that there are no other suitable or deliverable alternatives for a development of this size. This has been demonstrated through a full consideration of alternatives, including the evaluation through Strategic Environmental Assessment.

15.2.3 The consideration of alternatives was addressed within the ES Scoping Report submitted to Charnwood Borough Council. It was set out that an assessment had been undertaken by the Consortium to examine sites contained within the Council's Strategic Housing Land Availability

Assessment (SHLAA) at Loughborough, to establish whether there was a deliverable alternative site capable of delivering 3,200 dwellings, 16ha of employment land and associated infrastructure. From the assessment no single site was deliverable and therefore no reasonable alternatives existed. Furthermore, to be robust, an assessment was also undertaken that investigated a partial desegregated approach to identify whether a combination of different sites cumulatively exist as a deliverable alternative. It was established that a partial desegregated approach, combining a number of sites, did not deliver a reasonable alternative to the Development. In conclusion, such a desegregated approach is not consistent with the strategy contained within the Submission Core Strategy, nor is there sufficient deliverable sites that are collectively capable of delivering comparable Development to that proposed, alongside the associated infrastructure required.

15.2.4 The conclusion of the ES Scoping Report submitted to Charnwood Borough Council set out that through the extensive option appraisal work undertaken in the evolution of the Council's Core Strategy, Sustainability Appraisal process and SHLAA, and with the limits to the extent of the area formed by the A512(T) to the south, the M1 Motorway and B588 to the west, and the Hathern and Loughborough built up areas to the north and east, that there are no realistic alternative sites to deliver a planned SUE of circa 3,000 dwellings and 16 ha of employment land at Loughborough. The ES Scoping Report sought confirmation from Charnwood Borough Council that there are no strategic or site specific alternatives that need to be considered within the ES and that if the Council considered that there were, it should outline the details of those alternatives, along with justification, within its Scoping Opinion. The Council did not identify any strategic or site specific alternatives to be included within its Scoping Opinion, nor did it indicate that the ES should consider such. A briefing note on the appraisal of Alternative Sites considered as part of the EIA scoping process is reproduced at Appendix 1.1 of this ES.

15.2.5 As a result of the assessment set out within the Scoping Report, it was proposed that the ES will consider alternative land use arrangements within the Site including the comparative merits of locating, housing employment land and community facilities in alternative locations within the Site.

15.2.6 On the basis of the above, the following outlines the manner in which the Masterplan has undergone a continuous iterative process of alternatives to its formulation and refinement, informed by two independent OPUN Design Review Panels. Both of these design reviews evaluated a range of alternative configurations to bringing forward the proposal. The principal alternatives are outlined below:

- The location of employment land;
- The Black Brook Corridor;
- Community facilities; and
- Highway and road alignment.

15.3 The Location of Employment Land

15.3.1 Draft Policy CS22 of the emerging Charnwood Local Plan provides a draft concept layout for the proposed urban extension. Within this it contains three principal areas of residential development. Two larger parcels of residential development are located to the north and south of the Black

Brook, and a smaller third parcel of residential development to the northeast. For the provision of employment land, this is identified as being on the western edge of the site and again in two parcels. One north of the Black Brook and the other to the south of it.

15.3.2 The initial Masterplan followed this approach and identified two areas of employment land both north and south of the Black Brook. As part of the first OPUN Design Review the Panel was not convinced that the Core Strategy proposal was the most appropriate manner in which to provide new employment land. The OPUN Design Review Panel encouraged the consolidation of the employment land into a single sustainable location which should be close to a primary road. This would provide good access and connections to public transport to ensure an accessible location for the workforce.

15.3.3 Following further work the location for employment has been consolidated into a single parcel in the Site, with closer links to the Community Hub and the Strategic Link Road. This has resulted in residential development south of the Black Brook being relocated north of the brook. This has been integrated into the residential uses proposed in the area, and GI north of the Black Brook.

15.3.4 The second OPUN Design Review Panel was welcoming of the new approach to providing employment land and this has been carried forward into the development proposals of the application.

15.4 The Black Brook Corridor

15.4.1 The Site is divided into two principal areas of land north and south of the Black Brook. The Council's concept plan in Draft Policy CS22 directs development both sides of this corridor. The initial Masterplanning process followed this approach and the first OPUN Review Panel commended the strong landscape-led approach and the green infrastructure design concept. It was considered to be an '*intelligent and sensitive response'* to the historical site context. However, the Panel considered that the development appeared fragmented, with the Black Brook forming a divide rather than a unifying feature.

15.4.2 The OPUN Review Panel considered the Black Brook to be a very attractive feature and an asset that should be embraced and fully injected into the Masterplan. Combined with this, proposals for the village green and the Black Brook Corridor should be reviewed and evaluated on how it could create a linear village green, bringing stronger community emphasis in the valley along its length. It was suggested by the Review Panel that the focal spaces could include football pitches, playing fields, cycleways and walking routes.

15.4.3 The Masterplan has been reviewed in this context and a succession of revisions made that focus more on the Black Brook Corridor as a linear area of open space, sport and recreation. This has centrally focused the community and landscape design emphasis of the proposals.

15.4.4 With the combination of the relocation of the Community Hub, which is referred to below, the Black Brook Corridor has now become a central feature of the Masterplan and will be a catalyst for community integration, rather than a divide.

15.5 Community facilities

15.5.1 Draft Policy CS22 sets out that the Development is to be served by a local centre located towards the middle of the southern residential area, and the provision of a primary school. The second

primary school is proposed on the northern extents of the residential component to the north of the Black Brook Corridor. The initial Masterplanning approach followed this design concept and orientated the Community Hub and southern primary school along a secondary highway through the urban extension, as illustrated on the Council's Core Strategy Concept Plan.

15.5.2 The OPUN Review Panel commented on the linkages between the two principal residential areas north and south of the Black Brook and the potential for the northern component to become isolated and '*housing estate like*'. As a result, it encouraged the Consortium to look at ways to link the two areas of residential development using the Black Brook Corridor physically and visually. Also, it considered that the northern school had the potential of becoming isolated and that it would benefit from closer integration with the scheme.

15.5.3 Following a number of Masterplan iterations, the Community Hub concept evolved where the community facilities were moved northwards towards and adjacent to the Black Brook itself, with the southern primary school located adjacent to it. This also linked to the main employment areas, now consolidated to the west of the Community Hub and south of the Black Brook. The school on the northern section of the Site has been bought further south, closer to the Black Brook area, also locating it closer to the Community Hub.

15.5.4 This has now provided the Community Hub, employment areas, schools and sports and recreational facilities around a central Black Brood Corridor area. As such it has interconnected many aspects of the Development and provided a central hub of community activities. This was positively welcomed by the second OPUN Review Panel which commented that it now had a stronger community focus. The Review Panel also commented that the connections to Loughborough were well developed along with connections to neighbouring villages and settlements.

15.6 <u>Highway and road alignment</u>

15.6.1 The emerging Core Strategy includes a Strategic Link Road through the Site and this has been incorporated into the emerging Masterplan for the Development. The alignment of the Road was informed by a 'Highway Route Assessment' Report prepared by Peter Brett Associates in 2007 (subsequently referred to as the 2007 PBA report). This considered a range of options for providing the Strategic Link Road and concluded that the route as illustrated in the Core Strategy as the most viable at the time.

15.6.2 The route of the road in the emerging Core Strategy runs from the A512(T) at the south of the Site northwards through Garendon Park at its western edge. It then joins the east / west route running north of the Black Brook. A second route is also included running through the southern residential area up to the north eastern section of the allocation. The local centre and primary school for the southern parcel of residential development is illustrated on this second route.

15.6.3 The initial Masterplan proposals followed the concept contained within the Core Strategy with the Strategic Link Road running to the west of the Site and the southern primary school and community centre located on the second route through the Development.

15.6.4 The initial OPUN Review Panel expressed concerns regarding the proposed Strategic Link Road through Garendon Park, as it was considered to have a potential visual and physical impact on the Park. It was recommended that further consideration to other possible means of access, including the potential for a new motorway slip road. It was also suggested that should other

options prove impractical/unviable then the mitigation and treatment of any route through the Park was highlighted as being critical and must be sensitively executed.

15.6.5 The Consortium undertook an extensive amount of work to appraise a number of ways in which the route through the Park could be accommodated sensitively, including the option of cutting the road into the landscape, leaving the road at-grade and options around a 'low key' route without footpaths and lighting. A second OPUN Review Panel still expressed concern relating to the revised route and while it appreciated the extent of progress made, felt that additional work was still required, particularly as to whether the road could be moved further westward towards the M1 corridor.

15.6.6 Following the two OPUN Review Panels and in close liaison with English Heritage, Charnwood Borough Council, Leicestershire County Council and the Highways Agency, a comprehensive review of Strategic Link Road options was undertaken by the Consortium. Within this all previous options were reconsidered.

15.6.7 The outcome of the review was that the previously rejected Option 3 in the PBA report (with the Strategic Link Road moved closer to the M1) now offered more of an opportunity for a solution in light of recent evidence illustrating this option would not now be affected by M1 widening constraints, as was previously the case. On this basis, further investigative work was undertaken on Option 3 of moving the Strategic Link Road closer to the M1 corridor.

15.6.8 Following this evaluation and through working with Charnwood Borough Council, Leicester County Council, English Heritage and the Highways Agency it is confirmed that the previously rejected alignment Option 3 now offers potentially the best solution to the Strategic Link Road. Both Charnwood Borough Council and Leicestershire County Council have now confirmed that the proposed route of Option 3 is the preferred route, and in their opinions is supported by the Core Strategy evidence base work.

15.6.9 The Masterplan has therefore taken this new revised route closer to the M1 corridor as the preferred approach. Furthermore with the consolidation of the Community Hub, employment area and schools, the need for a secondary route through the Development is no longer present. Therefore while the Development will be served by an interlinking road network, the primary access through the Development will be through the single Strategic Link Road.

15.7 Conclusion

15.7.1 As set out above, a number of key alternatives have been evaluated as part of the Masterplanning process. This iterative approach to developing the proposals, including the involvement of OPUN Design Review Panels, has moved forward the initial concept layouts contained within the Draft Core Strategy into a comprehensive Masterplan for the scheme.

15.7.2 This has collectively consolidated many aspects of the original Concept Plan in the emerging Core Strategy and created a more integrated Development. It has consolidated the Community Hub proposal and interlinked the schools with the residential areas as well as ensuring the employment areas are well located to the community centre and local highway network. The Black Brook Corridor has also become a green feature, offering recreational and green infrastructure provision. It has become a key feature rather than a divide.

15.7.3 The Strategic Link Road has been through an iterative design and options process that has returned to look at previously discounted options and developed a solution that is agreeable to the Highways Agency, Leicester County Council, English Heritage and Charnwood Borough Council.

15.7.4 As a result, the Development has been through a comprehensive iterative process where alternatives have been fully explored to refine the proposal as submitted.

16 CUMULATIVE AND INDIRECT EFFECTS

16.1 Introduction

16.1.1 The EIA Regulations require Environmental Statements to provide a description of:

> *"any indirect, secondary, cumulative, short, medium and longterm, permanent and temporary, positive and negative effects of the development"*.

16.1.2 This section examines cumulative and indirect effects in accordance with the Regulations.

16.2 Cumulative Effects

16.2.1 Cumulative Effects are considered to be the effects that result from incremental changes caused by other past, present or reasonable foreseeable actions together with the Development.

16.2.2 For the purposes of cumulative effects, this ES has considered the cumulative effects of the Development alongside the following proposals:

- Loughborough University Science and Enterprise Park;
- Biffa Waste Incinerator Scheme;
- Dishley Grange Employment; and
- Off-site highway improvements / Ashby Road widening.

16.2.3 Where appropriate, each of the above are considered within each Chapter of the ES with a summary provided below of the cumulative effects of each.

Loughborough University and Science and Enterprise Park

16.2.4 CBC's emerging Core Strategy allocates an extension to the west of the University Science and Enterprise Park. The University Science and Enterprise Park would accommodate a range of developments. Subject to future demand these could include start-ups, small units and shared facilities as well as larger scale buildings for technology based firms from the region, larger corporate companies with research and development related projects from other parts of the UK, and other new University related research and development projects.

16.2.5 As set out in the relevant Chapters of this ES, the Development will not give rise to cumulative effects with the Loughborough University and Science and Enterprise Park in respect of archaeology, cultural heritage, traffic and transportation, noise, hydrology and water quality and geology and ground conditions.

16.2.6 In respect of landscape and visual impact, Chapter 6 of this ES has set out that the landscape to the west of the University provides an attractive approach to Loughborough and forms the north-eastern part of Charnwood Forest Regional Park together with the National Forest which will be maintained by a parkland setting proposals of the University Science and Enterprise Park development. It is also noted that as a gateway to Loughborough, the University Science and Enterprise Park provides an opportunity to provide landmark buildings on prominent frontages in

support of the emerging Core Strategy Vision for high quality design. Therefore it is concluded that the University Science and Enterprise Park is unlikely to cause any significant adverse effects. The effects of the Development, when considered in the context of the envisaged University Science and Enterprise Park, would therefore not result in significant cumulative adverse effects upon the local landscape and visual resource.

16.2.7 In respect of ecology, Chapter 10 of this ES sets out that the University Science and Enterprise Park proposals include extensive green-space and therefore any adverse effects on features of nature conservation value can be fully mitigated within the University Science and Enterprise Park, with the possible exception of farmland birds. If insufficient mitigation is provided for the loss of habitat for these species, there is potential for the effect to combine with the effects of the West of Loughborough SUE, resulting in an overall significant adverse effect. However, given that the West of Loughborough proposal provides significant measures to minimise the effects on farmland birds, provided that the University Science and Enterprise Park is required to provide appropriate levels of mitigation, the residual combined effect would not be significant.

Biffa Waste Incinerator Scheme

16.2.8 Permission was granted on appeal in 2012 for an incinerator at the Newhurst Quarry site, Shepshed, located to the south of Ashby Road A512(T) and west of M1 Junction 23 (Application Ref 2009/2497/02 (2009/C166/02). The approved scheme has not been implemented and revised plans are expected to be submitted during 2014.

16.2.9 An assessment of this permission has been undertaken in the ES and no signficant cumulative effects identified associated with archaeology, cultural heritage, noise, hydrology and water quality and geology and ground conditions.

16.2.10 In respect of landscape and visual impact Chapter 6 of this ES sets out that part of the mitigation for the incinerator scheme was to re-create the former geometric tree-lined avenues in the south western portion of Garendon Park and undertaking the repair and restoration of the Temple of Venus and the Triumphal Arch. Given the proposed mitigation the Inspector agreed with English Heritage's assessment that the impact upon heritage assets would be less than substantial and that there would be a benefit to the designated heritage assets by returning a level of authenticity to the planting arrangement and setting of the buildings.

16.2.11 As part of the Development, Garendon Park would be restored in a manner which reflects the original 1777 Estate Map. It includes tree lined avenues proposed within the southern part of Garendon Park which would connect the Triumphal Arch, Temple of Venus and the White Lodge. Principles for the restoration have been agreed with English Heritage and are consistent with the mitigation proposed for the approved incinerator scheme.

16.2.12 The effects of the Development, when considered in the context of the incinerator scheme would not result in a significant cumulative adverse effect upon the local landscape and visual resource.

16.2.13 In respect of traffic and transportation, Chapter 9 sets out that the traffic flows associated with the waste incinerator are included within the baseline traffic included within the Transportation Assessment accompanying the planning application to which this ES accompanies, and will not give rise to an adverse cumulative impact.

16.2.14 In respect of ecology Chapter 10 of this ES sets out that in response to a EIA screening request in respect of amendments to the waste incinerator proposal, both Leicestershire County Council and Natural England agreed that, notwithstanding the need for surveys to be updated, the assessment provided in the original Environmental Statement in respect of ecology still stands. The ecological assessment in the Environmental Statement concluded that the "restoration and habitat enhancements outlined would compensate in the long-term for the loss of habitat resulting from the proposed construction of the ERF" and that "the long-term management of these habitats should ensure that habitats of ecological value are maintained at the site for the long-term." It is therefore unlikely that any cumulative effects would arise from the incinerator scheme in combination with the Development.

Dishley Grange Employment

16.2.15 The Dishley Grange site adjoins Loughborough's established Bishop Meadow Industrial Park on the northern fringes of the Town, with convenient access off a new roundabout junction on the A6(T). The site is allocated within the Council's emerging Core Strategy and is planned for B1/B2/B8 industrial, warehouse and office purposes.

16.2.16 The potential for cumulative effects have been appraised within this ES in respect of the Dishley Grange Employment site and no cumulative effects have been identified in respect of archaeology, cultural heritage, ecology, noise, hydrology and water quality, and geology and ground conditions.

16.2.17 With regards to landscaping and visual impact, the Dishley Grange employment development will be required to include substantial landscaping within the employment site to fragment the overall mass of the development. Belts of woodland planting and landscaping to a minimum depth of 20 metres will be provided to screen the development from important views and safeguard the setting of Dishley Grange. The development would also include the provision of replacement and improved playing field provision including changing rooms and associated parking facilities.

16.2.18 The effects of the SUE, when considered in the context of the Dishley Grange Employment site would not result in a significant adverse effect upon the local landscape and visual resource.

16.2.19 In respect of traffic and transportation, the traffic flows associated with the Dishley Grange site are included within the baseline traffic included within the Transportation Assessment accompanying the planning application to which this ES accompanies, and will not give rise to an adverse cumulative effects.

Off-site highway improvements / Ashby Road widening.

16.2.20 A range of potential off-site highway improvements have been identified to accommodate future development proposed within Loughborough. Potential highways improvement works include widening of various stretches of highway and junctions. The potential works would be largely contained within the limits of the current highway land and adopted carriageway.

16.2.21 The ES has considered the cumulative effects of the highway improvements and Ashby Road widening and identified that no cumulative effects arise with the Development. In respect of the construction effects of the Development, it is considered that these will be temporary in nature and that appropriate mitigation will be provided as set out in this ES.

16.3 Cumulative Effects of the Wider Masterplan Area

16.3.1 The Development comprises up to 3,200 dwellings and 16ha of employment to form a comprehensively masterplanned approach to development at West of Loughborough. The Development is consistent with the comprehensive approach to planning the area required through the emerging development plan.

16.3.2 The Development will provide positive cumulative effects for Loughborough and the wider Masterplan area in terms of the provision of new community facilities. This includes the provision of two primary schools, employment land, a mixed use Community Hub and a significant amount of Green Infrastructure and recreational open space. It is also proposed to redirect and improve existing bus routes, complemented with new routes through the Development, to serve the proposals. The comprehensive masterplanning of the Site has located all non-residential land uses along the principal transport corridors and within close proximity to each other and the Community Hub in order to reduce the need to travel by car for a the full range of services. Community facilities will also benefit the residential and non-residential development proposed within the Site.

16.3.3 The Development will also connect into and reinforce existing footway and cycleway links within and surrounding the Site, with new and existing desire lines incorporated as direct, safe and attractive routes within the wider Masterplan area. These will provide connections between natural nodes such as the proposed Community Hub, schools, sports and recreational areas, heritage assets, key landscape spaces and surrounding community facilities. The proposals will also encourage a greater permeability of Garendon Park which at present is not open to public access.

16.3.4 There will also be positive cumulative effects in terms of the provision of GI as part of the application proposals and the wider Masterplan. The application proposals will greatly exceed the Council's emerging open space and recreational requirements for development proposals through a range of open space typologies, including substantial recreational provision in Garendon Park. Therefore, it is demonstrated that the proposals will appropriately address the needs of the future occupiers of the development and also benefit residents within the surrounding area in respect of recreation provision. Provision of this new open space will also result in positive effects for ecological habitat enhancements through SUDS drainage and landscape enhancements.

16.4 Indirect Effects

16.4.1 Indirect Effects are considered to be the impacts on the environment, which are not a direct result of the Development, often produced away from the site that result from incremental changes caused by other past, present or reasonable foreseeable actions together with the development.

16.4.2 Indirect effects in terms of the interrelationships between effects of the disciplines identified within this ES have been considered, within each Chapter of this ES. It is concluded that there are unlikely to be any significant indirect effects.

16.5 Summary and Conclusion

16.5.1 It is concluded that based upon an assessment of the cumulative effects of the Development within the wider proposals of the Core Strategy it has been demonstrated that there will be a

range of positive cumulative effects, no significant negative cumulative effects, and no significant indirect effects.

16.5.2 The potential for cumulative effects to arise associated with the proposals contained within 16.2.2 above has been assessed within the ES in each relevant Chapter. It is concluded within the assessments and as summarised above, the Development will not give rise to significant cumulative effects in the context other development proposals.

17 CONCLUSION

17.0.1 This ES has been prepared under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 following a Screening and Scoping process, recognising that the Development constitutes EIA development.

17.0.2 The proposals comprise an outline planning application on a Site of 466ha for a mixed-use SUE at West of Loughborough, Charnwood.

17.0.3 The proposal is for residential development up to 3,200 dwellings; up to 16 ha of employment land of B1/B2 and B8 uses, a mixed use Community Hub of up to 4ha comprising a local convenience retail unit (2,000 sqm); up to 1,000 sqm of other A1 retail, A2 financial and professional services, A3 food and drink, B1 business and D1 uses; sites for Gypsy and Traveller provision totalling 1ha; two primary schools up to 2ha each; strategic open space including allotments; access roads and new Strategic Link Road; open space / landscaping and associated works; principal means of access; restoration of Garendon Park and assets; all other matters to be reserved.

17.0.4 The ES accompanies a planning application submitted to the Council in 2014. A range of criteria have been used with the individual Chapters of the ES to determine the main environmental receptors and significance of predicted impacts. Effects have been assessed quantitatively where possible, although specific areas have required informed qualitative assessments. Those effects which are considered to be significant prior to mitigation have been identified in the ES, with any residual effects following mitigation addressed in detail.

17.1 Socio-Economic Factors

17.1.1 The socio-economic assessment has demonstrated that the Development will deliver various positive effects during the construction and operational stage. This includes the creation of new homes, jobs and investment and social infrastructure, as well as local convenience shopping which will facilitate wider economic activity as a result of the envisaged investment and increased consumer expenditure. It has also been demonstrated that the Development will not result in any significant adverse effects on external social infrastructure as a consequence of new on-site provision and the proposed planning obligations relating off-site infrastructure contributions, particularly for education provision.

17.2 Landscape and Visual Amenity

17.2.1 The landscape character assessment of the Development has been undertaken which has also includes an assessment of the impact on the Strategic Link Road proposed through Garendon Park. This has indicated there with the mitigation set out within this ES, there will be no significant adverse effects on the landscape and visual amenity of the land. Landscaping will result in ensuring that visual separation exists between the proposal and nearby settlements, particularly Hathern to the north of the Development. As such no significant negative landscape or visual effects will be experienced in this regard.

17.2.2 The visual impact assessment indicates that there are no significant long distance impacts for the proposal, nor significant negative night time impacts associated with the Strategic Link Road through Garendon Park.

17.2.3 The loss of landscape features would be mitigated by new planting and high value features would be retained, protected and enhanced, particularly where they form natural buffers to other existing settlements and residential areas.

17.3 Archaeology and Cultural Heritage

17.3.1 The assessment has identified significant impacts on Garendon Park and associated heritage assets. The Development will result in both direct and indirect effects on the heritage assets identified as a result of change within their setting and physical alterations. In doing so it will have a major/moderate impact on the significance of the Registered Park as a result of the Strategic Link Road. Other effects have been identified as moderate impacts to the Registered Park, Triumphal Arch (grade I), Temple of Venus (grade II*), White Lodge, Lodge to Garendon Park, Shepshed Mill, Oakley Wood Cottages and Stonebow Bridge (all grade II).

17.3.2 A summary of the effects of the Development on Archaeology is provided in Section 7 of this ES which sets out that the only significant below ground impact of Development within the Registered Garendon Park is confined to the route of the proposed Strategic Link Road. No significant archaeological remains have been identified along the route of the Strategic Link Road. Other below ground archaeological remains within the Registered Park will not be impacted by development proposals.

17.3.3 With mitigation measures in place comprising preservation by record the effect of the Development upon the identified archaeological Sites will reduce from moderate negative to minor negative.

17.4 Ecology and Nature Conservation

17.4.1 The design and layout for the Development has been arrived at through an iterative process, with the findings of ecological surveys providing informed advice on avoidance and reduction of ecological effects and inclusion of opportunities for ecological enhancement over successive design iterations. Through this approach, avoidance of or mitigation for key ecological effects has been successfully integrated into the Development. Where additional measures have been required to safeguard the ecological value of the Site, these have been specified in detail.

17.4.2 Measures have been identified to protect and enhance habitats of nature conservation interest occurring, and to avoid effects on protected and notable species within and adjacent to the Site. With implementation of these measures, there are concluded to be no overriding nature conservation constraints that would otherwise preclude the Development of the Site.

17.5 Traffic and Transportation

17.5.1 An assessment of the overall effects of traffic resulting from the Development on sensitive receptors; pedestrian amenity/fear/intimidation; public transport accessibility; pedestrian and cycle accessibility; link capacity; safety; and all construction effects has concluded there would be minor impacts of minor significance. In relation to the overall impact on junction capacity it is concluded the impact would be minor of moderate significance.

17.5.2 Mitigation measures are outlined in the Transport Assessment (Appendix 9.1) and the Travel Plan (Appendix 9.2). Measures focus primarily on walking, cycling and public transport measures, although some highway capacity improvements are proposed.

17.5.3 The construction of the Development is programmed across a finite period of time and it is therefore considered that there will be no residual traffic impact on the highway network following completion of the construction phase.

17.5.4 Once the Development is fully operational a significant number of on and off-site mitigation measures will have been installed to encourage sustainable transport modes. It is considered that the Development coupled with these proposals will have a low beneficial impact upon severance, pedestrian delay, pedestrian amenity, fear and intimidation and accidents and safety and a minor adverse impact upon driver delay.

17.5.5 The mitigation strategy for transport has very significantly influenced the Illustrative Masterplan. From this it is concluded in Chapter 9 that the increases in traffic generated by the Development is not considered to be the root cause of forecast congestion.

17.6 Air Quality

17.5.1 It is concluded that the potential for construction phase effects of dust generation and exhaust emissions from plant on-site are not predicted to be significant. The effects during the operational phase of the Development have also been considered within the detailed assessment of vehicle exhaust emissions. It is concluded that the effects associated with the operational phase of the development are negligible.

17.6 Noise

17.6.1 An assessment of the existing noise climate has indicated that, with appropriate mitigation during the detailed design, the Site is suitable for residential development.

17.6.2 The construction of the Development is likely to give rise to some noise impacts, however these impacts should be minimised by the implementation of best practicable means in construction working practices and are considered to be restricted to a limited period of time.

17.6.3 With regard to the operational phase noise, road traffic has been assessed; the change in noise level as a result of the Development in 2021 and 2031 has been assessed as well as the cumulative effects relating to other committed and non-committed developments. The change in road traffic noise level as a result of the proposals will be generally barely, if at all, perceptible. Due to the very low change in road traffic noise level, it is considered that the effect will typically not be significant.

17.7 Hydrology and Water Quality

17.7.1 The impact of the Development on flood risk, water quality and water resources has been assessed for both the construction and operation phases of the Development. The implementation of mitigation measures outlined above will reduce any residual effects of and by the Development site to Negligible/Minor Adverse. The implementation of the proposed surface water management strategy, as detailed in the Flood Risk Assessment (Appendix 13.1), will potentially bring a Minor Beneficial effect.

17.8 Geology and Ground Conditions

17.8.1 The impact on Dishley Grange Farm remains moderate adverse, as no mitigation is possible for the loss of the land early in the project. The eventual loss of Bedlam Hall Farm will potentially be substantial adverse, although some farming and the livery business can continue during early phases of the Development.

17.8.2 The loss of arable land will slowly build up to become a moderate impact on the contract-farming business that operates Garendon Park Farms, although the sale of the land for development will financially benefit the Garendon Estate, perhaps allowing purchase of further farmland.

17.8.3 Implementation of the soil conservation policies will result in a minor adverse residual impact on the soils with landscape areas and public open space but a moderate to major impact on soils sealed by buildings and hard surfaces.

17.8.4 The loss of 142 ha of best and most versatile land in grades 2 and 3a (30% of the entire site), and would be a substantial adverse effect on such land in the county. However, the poorer sub-grade 3b land and the best and most versatile land are in a complex pattern whereby both categories are present in many fields with the sub-grade 3b land controlling use. Consequently the adverse impact is considered to be moderate overall.

17.8.5 It is considered that there will be no residual impact on mineral deposits on the site as superficial deposits on the site are not suitable for use as an aggregate, and the underlying mudstone is not regarded as being of any commercial use or value.

17.9 Cumulative and Indirect Effects

17.9.1 It is concluded that the based upon an assessment of the cumulative effects of the proposals set out in paragraph 16.2.2 of this ES that no cumulative effects will arise from the Development with the mitigation proposed.

17.9.2 The assessment of cumulative effects of the Development has demonstrated that there will be some positive cumulative impacts, no significant negative cumulative impacts, and no significant indirect effects.

17.10 Alternatives

17.10.1 As set out in Chapter 15 of this ES, an assessment has been undertaken of potential alternative sites to deliver a SUE at Loughborough and concluded through the scoping of the ES that no alternative location exists to deliver a SUE for up to 3,200 dwellings, 16ha of employment land and associated infrastructure. As such, no alternative locations for a SUE are considered within this ES.

17.10.2 A number of key alternatives to the configuration of the proposal have, however, been evaluated as part of the ES and Masterplanning process. This iterative approach to developing the proposals, including the involvement of the OPUN Review Panel has moved forward the initial concept layouts contained within the emerging Core Strategy into a comprehensive Masterplan for the scheme.

17.10.3 This has collectively consolidated many aspects of the original concept plan in the emerging Core Strategy and created a more integrated development proposal. It has consolidated the

Community Hub proposal and interlinked the schools with the residential areas as well as ensuring the employment areas are well located to the Community Hub and local highway network. The Black Brook Corridor has also become a linear feature, with recreational and GI. It has become a key feature rather than a divide.

17.10.4 The Strategic Link Road has been through an iterative design and options process that has returned to look at previously discounted options and developed a solution that is agreeable to the Highways Agency, Leicester County Council, English Heritage and Charnwood Borough Council.

17.10.5 As a result, the proposals have been through a comprehensive iterative process where alternatives have been fully explored to refine the proposal as submitted

17.11 Summary of Effects

17.11.1 Each Chapter of the ES provides a detailed summary of the significant effects of the Development. The following provides a summary of this information.

Table 17.1 Summary of Effects

Environmental Issue	Impact	Effect
Socio-economic	Job creation	Significantly positive effects associated with 4,800 jobs created within the construction phase, 2,880 jobs within the supply sector and 1,360 jobs created as part of the Development's Operational Phase.
	New Homes provided	Significantly positive effects associated with the provision of up to 3,200 new homes
Landscape and Visual Impact	Landscape Impact	With mitigation proposed there will be no significant adverse effects on Landscape
	Landscape and visual Impact on nearby settlements	Landscaping buffers will maintain visual separation of the Development from nearby settlements resulting in no significant effects in respect of this factor.
	Long distance visual impacts	No significant effects are predicted associated with long distant views for the Development.
	Night time Impacts of the Strategic Link Road	No significant adverse effects are identified associated with the Strategic Link Road through Garendon Park.

Environmental Issue	Impact	Effect
Archaeology	Garendon Park	No significant effects have been identified associated with the Strategic Link Road through the Park. Other below ground archaeologic remains within Garendon Park will not be impacted upon by the Development.
Cultural Heritage	Garendon Park	Moderate adverse impacts on Garendon Park and heritage assets with major/moderate adverse impacts on the Registered Park. There are also a number of significant beneficial impacts as a result of the Development. Mitigation is also proposed.
Ecology and Nature Conservation	Ecology and nature	No significant effects have been identified with measures proposed to protect and enhance habitats of nature conservation interest.
Traffic and Transportation	Sensitive receptors	Minor impacts of minor significance have been identified for transport receptors.
	Junction capacity	Overall, impacts on junction capacity are concluded as being of minor significance.
Air Quality	Dust and air quality	No significant effects are identified associated with operational and construction impacts for air quality.
Noise	Noise	Construction impacts are likely to give rise to minor impacts with mitigation provided. Operational impacts will be barely if at all perceptible and therefore no significant effects are associated with noise.
Hydrology and Water Quality	Flood Risk	The effects of the Development and with mitigation proposed will bring about a minor positive beneficial effect.
Geology and Ground Conditions	Minerals	No impact on minerals deposits is predicted
	Agricultural land	The adverse impact is considered to be moderate overall.