

Dunsbury Hill Farm
Environmental Statement
Volume 1

Portsmouth City Council

March 2012

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Notice

This report was produced by Atkins Ltd for Portsmouth City Council for the specific purpose of Environmental Impact Assessment update for a proposed development at Dunsbury Hill Farm.

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Non Technical Summary

Introduction

A planning application has been submitted to Havant Borough Council (HBC) by Portsmouth City Council (PCC) for development of Dunsbury Hill Farm for employment uses and a quality hotel with conference facilities.

This is a hybrid planning application, meaning an application that is in part outline and in part detailed. Outline permission is sought for employment uses and a hotel with conference facilities and ancillary uses, a detailed permission is sought for a new link road to Hulbert Road and a link road with bus-gate to Woolston Road; together with landscaping, infrastructure and associated works. These works comprise the "Proposed Development". All matters apart from Access are reserved.

This summary forms part of an Environmental Statement (ES) which has been prepared to accompany the application. It outlines the proposed scheme, the likely significant environmental effects and any mitigation proposals necessary to reduce adverse effects.

The Site

The Site a 33 hectare area of land located to the west of Leigh Park, Havant. The Proposed Development includes 20.2 hectares which will be developed for employment uses and a hotel with conference facilities. The rest of the Site will be developed to provide a comprehensive landscape framework and supporting infrastructure including a new link road.

The Site is within the ownership of Portsmouth City Council apart from a small area of land adjacent to Hulbert Road which is in the ownership of the Department of Transport.

It is located on undeveloped land between Waterlooville and Leigh Park on the north western side of Havant Borough. The Site lies immediately to the east of the A3(M) motorway Junction 3, and the A3(M) runs along the western edge of the Site.

The residential area of Waterlooville lies to the west of the Site, while the Leigh Park estate lies to the east. Open countryside consisting of blocks of woodland and agricultural fields lie to the north of the Site. There is a further area of woodland and agricultural fields to the south of the Site, with superstores located further south on Purbrook Way.

The slip road leading off the A3(M) is the B2150 Hubert Road, which runs on the western side of the Site, and is proposed to provide access for the Proposed Development

The Site gently rises from 20 metres AOD in the south to approximately 45 metres AOD in the north. The Site falls away to the east down towards the wooded enclosures around Hermitage Stream and down in the south west towards the A3(M) embankment. An exposed high point or ridgeline coincides along Park Lane Bridleway 123. Land to the east, adjacent to Calshot Road and Prospect School is open, levelling out to the Leigh Park area at circa 15m AOD.

The principle urban features are the western settlement edge of Leigh Park and a large pylon with overhead cables running north to south across the Site. The A3(M), although not directly visible, can be heard and it becomes visible with a more audible presence at the raised roundabout at Junction 3.

The Site comprises a series of extensive open fields enclosed with established hedgerows. It is dissected across the north east corner by Park Lane Bridleway which connects Waterlooville with the Leigh Park estate and runs south-east to north-west across the Site and crosses the A3(M) via a footbridge.

The borders of Waterlooville are largely contained and not visible due to the mature embankment vegetation along the A3(M). The western side of Leigh Park is topographically lower and the borders are wooded

restricting any views. The housing of Leigh Park is predominantly brown and red brick 1960s low to medium rise terraces and apartments, built as public housing stock.

Background to the Development and Evolution of the Proposals

The proposals for the development of employment uses at Dunsbury Hill Farm have been evolving for a number of years. The site at Dunsbury Hill Farm was first allocated for employment uses in the Revised Deposit Draft Havant Borough District-Wide Local Plan, February 2002. The justification for additional employment land within the Local Plan was based on two important issues:

- A serious lack of supply of good quality employment sites to attract inward investment and provide for expansion of existing businesses; and
- Problems in the Havant economy evidenced by high out-commuting, higher than average unemployment (in some wards) and an over dependence on traditional manufacturing.

As part of the Local Plan development process, HBC carried out a range of studies into the supply of and demand for employment land in the Borough. This work considered both the general need for employment land, and also the specific need for it in relation to given sites.

A number of alternative sites were considered in a study of the A27 Corridor, commissioned by SEEDA and produced by Grimleys and Vail Williams. This study concluded that, whilst other employment sites were available in the Corridor, none provided the opportunities for raising standards and facilitating inward investment in the way that Dunsbury Hill Farm provided and that other smaller sites had relatively poor infrastructure, were too small and could not offer a location able to create a 'critical mass' from employment land with higher skilled jobs. The then Revised Deposit Draft of the Local Plan was revised to increase the supply of employment land. Dunsbury Hill Farm was allocated as a suitable site in Policy EMP 1.10.

A masterplan for a business park at Dunsbury Hill was produced and supported by an Environmental Statement (ES) which was published in February 2003. The masterplan was considered as part of the Local Plan Inquiry held between November 2002 and June 2003. The Inspector's report of 6th May 2004 noted that "some development with a reduced volume and spread of building could be accommodated at Dunsbury Hill Farm whilst ensuring the retention of the Strategic Gap function. However, in the absence of any information that a reduced scheme would be viable it is concluded that the land should revert to the Strategic Gap designation."

A study was consequently commissioned to revise the masterplan to address the comments made by the Inspector so that the site could be re-submitted into the Local Plan as a modification. This assessment is detailed in a report by Rummey Environmental Ltd, 'Dunsbury Hill Farm, Siting of Employment Allocation in the Strategic Gap, October 2004'.

The site was subsequently included in the Havant Borough District-Wide Local Plan (adopted by HBC in September 2005) as an Employment Site under Policy EMP 1.4 - Land at Dunsbury Hill Farm, Park Lane, Havant/Waterlooville on the grounds that all other options considered were not as suitable for the use proposed or there were difficulties with the land ownership of other sites.

In addition the Partnership for Urban South Hampshire (PUSH), a partnership of 11 Local Authorities in Hampshire, developed a Sub-Regional Strategy for South Hampshire under the South East Plan which was underpinned by a goal to improve the sub-region's economic performance. PUSH recognised Dunsbury Hill Farm as a key strategic employment site in a number of evidence based studies.

The HBC Regeneration Strategy for Havant Borough and the Leigh Park Strategic Framework (July 2006) identified Dunsbury Hill Farm as a major development opportunity. The Site was considered important because it will deliver a considerable number of jobs next to Leigh Park which is a priority area for regeneration, as well as providing space for start-up businesses.

The Havant Borough Council Core Strategy adopted on 1st March 2011 sets the planning framework for the Borough until 2026.

Policy CS18 Strategic Site Delivery identifies strategic sites that are critical to achieving the Borough's Core Strategy vision, and provide the development requirements for the site at Dunsbury Hill Farm.

The Core Strategy states that *"Dunsbury Hill Farm is a key strategic employment site for the borough and the wider sub-region, which will form a new businesses gateway to South Hampshire from the A3(M). The creation of a high quality business and technology park with excellent transport connections will deliver a large number of jobs in close proximity to Leigh Park. It will provide new first class employment floorspace for start-up and growing businesses. It could provide approximately 60,000 square metres of new employment floorspace. This is about a third of the total requirement for new employment in the borough up to 2026."*

The Proposed Development

The Proposed Development which is the subject of this ES comprises the following principal elements:

- Employment uses (B1, B2 and B8) including an Enterprise Centre (46,450m²) in Phase 1;
- A hotel with conference facilities (5,574m²);
- Employment uses (B1, B2 and B8) (15,329m²) in Phase 2;
- A new access junction off Hulbert Road;
- A bus gate with Woolston Road;
- A new west to east link road through the Site with a dedicated public transport link to connect the site to Leigh Park;
- Retention of existing trees and hedgerows where possible;
- Provision of a 150-180m wide landscaped gap between the A3(M) and the Proposed Development and east – west green finger providing landscape structure to the Site;
- Maximum building heights.

The Proposed Development will encompass transport infrastructure consisting of a new access junction to connect the Site to the A3(M) via Hulbert Road, a bus gate to connect the site to Leigh Park through a bus only access point, a link road to define the primary circulation route through the Site with a dedicated public transport link to maintain and improve circulation to and around the site. The existing bridleway which crosses the Site will also be maintained and improved.

The major land uses including employment and a hotel with conference facilities will be developed over two phases. A strong landscaped buffer will be created and as far as practical, existing features of nature conservation interest and landscape importance including trees and hedgerows will be retained.

Phase 1 of the development is located in the southern and central portions of the Site and, in line with the requirements of the Core Strategy, comprises 13.2 ha of land which will accommodate 46,450m² of employment floor space (Use Classes B1, B2 and B8), that will include 10,000m² for an Enterprise Centre and 5,574m² of hotel floor space. Phase 1 also includes other ancillary uses required to support the site and its employment uses.

Phase 2 of the development comprises 7 ha of land and is located in the northern portion of the site. Phase 2 will provide an additional 15,329m² of employment floor space with B1, B2 and B8 Uses.

The hotel is located on the south western side of the Site to enable the creation of a high quality entrance and landmark feature. Parameter Plan 2 indicates that this facility will be located to the south west of the Proposed Development close to junction 3 with the A3(M) and the southern spur road that forms an extension to Hulbert Road (the B2150) in a northerly direction.

Link Road

The design specification for the link road is set out in the Highway Design Report which accompanies this planning application. To summarise the proposals comprise:

- A four arm standard roundabout on Hulbert Road;
- A lay by accessed off the fourth arm of the roundabout on Hulbert Road;
- Joining into the existing roundabout on Woolston Road;
- Two way single lane carriageway between the proposed new roundabouts on Hulbert Road and Woolston Road;
- A bridge over Hermitage Stream;
- A 3m wide shared footway/cycleway to the north and a footway to the south of the link road between the hotel roundabout and Woolston roundabout;
- A bus stop in each direction (located within lay bys between the hotel roundabout and the Woolston Road roundabout).
- A bus gate at the Woolston Road roundabout to prevent access to the Proposed Development by general traffic.

The layout has been designed to avoid any perceived coalescence between Havant/Leigh Park and Waterlooville/Cowplain urban areas with careful consideration of the integration of built form within the landscape such that built form is screened by the established and proposed landscape structure

Building Scale

Rooflines of buildings within Phase 1 will be below the 40m contour to exploit the screening effect of Beech Wood and planting alongside the A3 (M) corridor. Phase 2 rooflines will be below the 45m contour to ensure that Dunsbury Hill and Bell's Copse and the planting to the east of Park Lane Stream will screen views into the Site.

Appearance

The Design and Access Statement discusses potential appearance of the Proposed Development based on the development principles. In terms of development character, the built form will be generally organic with the lengths of building footprints limited in order to integrate the development into the wider landscape. Design will consider natural surveillance and seek to create active busy spaces.

Environmental Impact Assessment

An environmental impact assessment of the effects of the development has been conducted by members of the assessment team, based on a series of development parameters relating to land use, scale (building heights) and movement. These parameters are illustrated.

Summary findings are presented below, covering impacts during construction and on completion of the development.

Land Use

The land is currently under grazing and woodland land uses and based on the evidence from the specialist survey it is not likely to be of Grade 3a or above (best and most versatile). The total permanent land take from agricultural land is ca 33 ha. In national and regional terms there would be a permanent adverse effect of slight significance.

The majority of the land is let to two tenants on short-term arrangements that could be terminated at short notice. The Site is ancillary to the wider business of one tenant and there will be a very slight impact on his business. The impact on the other tenant will be neutral. This tenant grazes the fields as a hobby and they do not form part of his business.

Socio Economic

Leigh Park has a population of about 26,700 with a relatively young age structure. Overall the area suffers from high levels of deprivation. Many of the manufacturing firms that were once based there have now left the area and there is a significant gap between the skills of the local population and the jobs available in the sub-region. Leigh Park District Centre has a high level of vacant retail units and the area is characterised by high levels of social rented housing. The Core Strategy recognises that addressing the skills gap is a priority for the regeneration of the area and the provision of new employment facilities in the area is equally important.

The Proposed Development will generate major economic benefits in the form of temporary and permanent employment creation and increased economic value. During the construction phase, it will create some 844 direct construction jobs plus a further 245 indirect / induced jobs at the local level and 371 at the regional level. During the operational phase it will create 3,506 gross direct jobs, with 1,272 being net additional jobs at the local level and 1,893 at the regional level.

The Proposed Development will ensure that the supply of employment land meets local needs over the period to 2026, providing a high quality mix of business premises. The scheme will generate additional annual GVA of £44.3 million at the local level and £72.5 million at the regional level and provide a major boost to the local economy.

The creation of a wide range of office, industrial and warehouse jobs will provide local people, local skills and learning providers and local businesses with the opportunity to work in partnership to address the area's skills gap and enable local people to fully capture the benefits of the new jobs in their area.

The Proposed Development is expected to have an overwhelmingly positive socio-economic impact, contributing towards the economic development and regeneration objectives of the area.

Transport and Accessibility

The Proposed Development would include a new access junction forming a roundabout on B2150 Hulbert Road and a link road to the west, with a bus only link to the east connecting to Leigh Park.

The Site, currently consisting predominantly of agricultural land, is located close to the A3(M) Junction 3 between Waterlooville and the Leigh Park area of Havant. The B2150 Hulbert Road past the Site has no pedestrian footways and has a derestricted speed limit. This connects to Purbrook Way further south of the Site at an un-signalised roundabout, which currently experiences congestion. Purbrook Way leads west to Junction 4 of A3(M). The Leigh Park estate is a 20mph zone with footways and street lighting. Havant town centre is located approximately 3km south east of the Site.

The traffic model assessment shows that in 2026 with Phase 1 and 2 of the development there would be an increase in queues and delays in the local road network. In particular queues would increase at the Hulbert Road / Purbrook Way roundabout and journey time increases would be most significant travelling southbound on Hulbert Road. These impacts are offset to some extent by the significant improvements to the public transport network that would be facilitated by the site with the Cross Borough Service.

Air Quality

Air quality in the vicinity of the Site is likely to be relatively good, as pollutant concentrations are currently below the Air Quality Strategy (AQS) objectives, and HBC has not currently declared any Air Quality Management Areas.

The Site is located in a residential area with no permitted industrial installations within a one kilometre radius. The nearest major pollutant source to the site is the A3(M). There are no designated international ecological sites within a kilometre of the proposed site.

There are 444 properties within 200 metres of the development. Provided dust mitigation measures are implemented during construction, the risk to these surrounding properties from dust nuisance would be negligible. Traffic travelling to and from the Site during construction would be most likely to use the A3(M) for

access, with construction workers additionally using the local road network. The effect of construction traffic is expected to be negligible.

Results of the local air quality assessment have shown that changes in concentrations of nitrogen dioxide and PM10 due to the Proposed Development are small or imperceptible at all receptors, in both future years of assessment. As concentrations would be expected to remain below the AQS objectives both with and without the Proposed Development, the overall effect on air quality is considered to be negligible.

Noise and Vibration

With appropriate noise mitigation measures and good working practices, it would be possible to minimise the duration and extent of significant construction noise effects. A number of generic noise control measures have been described in the ES.

The operation of the site, including the car parks, site traffic and night time deliveries is unlikely to have a significant effect on the nearest noise sensitive properties. Where there may be potential noise impacts from the unknown usage of the units, the detailed design of the Proposed Development and conditions imposed can ensure that the nearest residents are not affected by the noise from the Site outside acceptable limits.

The noise from the A3(M), the access road, the car parks and night time deliveries is most likely to affect the proposed hotel. The design of the layout, construction and orientation of the hotel can influence the noise levels within the hotel bedrooms.

An increase in traffic flows by 25% or a decrease by 20% would result in a 1 dB noise change. It is expected that the additional road traffic generated by the Proposed Development would be sufficiently low volume not to affect existing road network.

Cultural Heritage

The Site contains no designated heritage assets and no significant known heritage assets. There would be no effects on any designated heritage assets and their settings.

The main issue identified was the likely significant effects of the Proposed Development on currently unidentified archaeological remains that may lie within the Site. This reflects the fact that the Site has not been subject to past development and construction phase of the development therefore has the potential to disturb and degrade currently unidentified archaeological remains. To address this issue, a comprehensive programme of archaeological research has been recommended.

Ground Conditions and Land Contamination

No contaminated land was found during the recent limited intrusive investigation. There is some suggestion from the desk study that contaminated land may be present on the Site as a result of the infilling of ground with inert waste from the A3(M) construction works. This has been interpreted to mean excess spoil not required for the motorway earthworks. The presence of significant quantities of substances harmful to environmental or human receptors is expected to be unlikely. The effect on the scheme of any contaminated land is therefore assessed as neutral in the long term.

Water resources and Flood Risk

There is not anticipated to be any significant effects on the water environment during construction or operation.

The key water environmental receptors at the site include Hermitage Stream and Park Lane Stream. It is assumed that much of the surface water run-off will be discharged to these receptors. Due to the type of geology and the soils of the Site there will be no drainage directly to infiltration.

The provision of a restored section of Hermitage Stream will provide minor ecological geomorphological and local flood risk benefits to this Site.

The level of pollution from run-off from the main link road is low. However, to follow best practise and the general drainage philosophy for the Site, it is proposed that a form of sediment retention, such as swales or gulley pots, is used, and storage provided for a serious spillage at the roundabouts to the west of the Site.

The Proposed Development will increase impermeable areas on Site and will require attenuation mitigation.

The differing land use will require different levels of mitigation. Examples of the different levels of mitigation have been described in the ES.

Landscape and Visual Assessment

Landscape Effects

From a wider perspective the effects upon the landscape and other designations can be described as follows:

- No effect upon the South Downs National Park or the Chichester AONB, as the Site falls within the South Hampshire Lowlands (NCA 128) and sits within the settlement context of Waterloo or Havant and not the more open land to the north which falls with the associated South Downs NCA, 125;
- Localised impact upon the landscape character of the land within the Strategic Gap, with retention of the strong existing pattern of woodland compartments. The proposals do provide opportunity to reinforce woodland, particularly boundary planting, helping to mitigate the effects with careful location of proposed buildings within an overarching landscape structure;
- Minimal impact upon the wider landscape character areas;
- Impact upon site vegetation would be limited with the majority of vegetation retained and reinforced as part of the proposed landscape structure with the exception of the loss of the mature oak/ash trees along the proposed alignment of the link road to the immediate north of its junction with Hulbert Road. Localised mitigation measures could be employed such as 'No Dig Design Solutions' for trees which are located at the edge of the Link Road corridor;
- Impact upon the footpath network could be mitigated by providing footpaths and additional east-west connections, within the Site itself, encouraging walking;
- Watercourses, specifically Hermitage Stream, could be improved with retired banks and decanalised appearance. Woodland cover should be managed to diversify the habitat, improve accessibility and potentially to create a north-south walk via Neville's Park; and
- Local environmental improvements could provide benefit to the wider Leigh Park especially on the eastern boundary of the Site; measures could include improvements to open space and management of spaces used for recreational purposes.

Overall, the impact upon the landscape of the Site is considered to be minor to moderate adverse, reducing to minor adverse with time, as the link road and development are integrated into the existing established landscape by the new landscape structure.

Visual Effects

Views to and from the Site are contained, limiting the visual influence of the Site and any associated impact upon the receptors identified. Those visual effects which are key to consider include:

- Views from the properties identified adjoining the Site, principally Calshott Road and Ramsdale Road, to identify adequate screening adjoining the Site and within the Site between the development parcels, particularly to screen any glimpse or oblique views from more distant views such as properties at the new Woolston Road development;
- Views of different parts of the Site from Bridleway 123 which will be close to development parcels and the views would change substantially. The development will need to consider how this route can be

integrated and devise means of mitigating the visual effects. For example considering the potential for a new visual framework as part of the built form within the masterplan; and

- Limited visibility of elevated parts of the Site will need to be carefully considered in terms of the overall height of rooflines to avoid visual impact above tree canopies.

Overall, the impact upon the existing views is considered to be minor to moderate adverse, reducing to minor adverse with time, with the establishment of the structural landscape.

Ecology

A walk-over ecological survey of the Site and its immediate surrounds was undertaken on 20th July 2010 and on 12th August 2010, broadly following the 'Extended Phase 1' methodology as set out in Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment 1995). The land west of Hulbert Road was surveyed on 13th September 2011, based on the latest design for the connection of the new link road to Hulbert Road.

Further ecological surveys were undertaken between December 2010 and September 2011 to gather sufficient baseline information on protected species that could be affected by the Proposed Development, in order to inform the layout and design of the scheme.

A detailed vegetation survey was undertaken in May 2011 within fields in the south of the Site that will be directly affected by the construction of the link road. Five hedgerows that are within the Site or on the boundary were inspected in May 2011 in relation to the 'wildlife and landscape' criteria set out in Schedule 1 of the Hedgerow Regulations 1997. There are three hedgerows at the Site or on the boundary of the Site that appear to qualify as ecologically important hedgerows under the Hedgerow Regulations (1997).

The Site only includes a small area of woodland at Neville's Park East SINC, although woodland adjoins the Site to the west, south and east boundary. These woodlands are designated as SINC's and are also either ancient woodlands or woodlands where there is a significant element of ancient semi-natural woodland surviving.

With proposed mitigation fully implemented, the significance of the overall effect of the Proposed Development on ecological features and protected species is likely to be neutral with some slight beneficial impacts and some slight adverse.

Waste and Recycling

The Proposed Development will result in the generation of 16,901 tonnes of construction waste and 2,751 tonnes per annum of commercial and industrial waste. If good recycling practices are adopted it will be possible to reduce the volumes of waste by at least 60% for construction and demolition waste and at least 50% for operational waste. This will reduce the impact of the waste on the existing waste treatment capacity in Hampshire and the associated environmental impacts. As the waste produced is minimal in comparison to the overall waste arisings in Hampshire and the available treatment capacity it is expected that the Proposed Development will result in a minor impact in terms of waste.

Habitats Regulation Assessment

A Habitats Regulations Assessment Stage 1 - Screening exercise has been undertaken for this project and has been reported separately in Appendix 15.1, Volume 3 of the ES. The Screening report focused on possible likely significant effects of the Dunsbury Hill Farm project on seven international sites, as agreed with Natural England.

The study showed that there are no likely significant effects on the international sites considered in this Stage 1 - Screening due to construction and/or operation of the Dunsbury Hill Farm development alone or in combination with other plans and projects, and that there is therefore no requirement for any further stages of the HRA process (i.e. Stage 2 - Appropriate Assessment) to be completed.

Cumulative Effects

The consideration of cumulative effects has determined that there are no interactions between the environmental topics that form part of the EIA that are likely to result in a significant effect on a single receptor.

It also confirmed that there are no relevant Core Strategy site allocations or consented schemes which might contribute to an assessment of cumulative effects save in respect of transport modelling. The EIA has concluded that the moderate increase in traffic flows will lead to imperceptible changes in traffic noise and air quality.

Conclusions

The Proposed Development responds to the need for increased employment in Havant and presents a sustainable way of accommodating a large part of Havant's development requirements.

This Environmental Statement has examined the significant environmental effects of the Proposed Development and has found that, whilst some adverse environmental effects are unavoidable, it is remarkable that, for a large scale development, the adverse effects are generally minor with many residual benefits being identified including a major beneficial socio-economic effect. Such adverse effects have been minimised, as far as is practicable, through sensitive and sustainable design and the adoption of best practice in the management and control of construction. These findings thus corroborate the initial work done by the Borough Council in identifying Dunsbury Hill as an area having the environmental capacity for major new development.

Glossary of Abbreviations

Abbreviation	Definition
AADT	Annual Average Daily Traffic
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BGS	British Geological Survey
BGL	Below Ground Level
BS	British Standard
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CPO	Compulsory Purchase Order
dB	Decibel
Defra	Department of Environmental, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment
ES	Environmental Statement
EC	European Community
EcIA	Ecological Impact Assessment
FRA	Flood Risk Assessment
GCN	Great Crested Newts
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GIS	Geographic Information Systems
GLVIA	Guidelines for Landscape and Visual Assessment
HBC	Havant Borough Council
HCC	Hampshire County Council
HGV	Heavy Goods Vehicle
HSI	Habitat Suitability Index
HRA	Habitats Regulation Assessment
Ha	hectare(s)
Km	kilometre(s)
LAQMTG	Local Air Quality Management Technical Guidance,
LCA	Landscape Character Assessment
LVIA	Landscape and Visual Impact Assessment
m	metre(s)

Abbreviation	Definition
m ²	square metre(s)
m ³	cubic metre(s)
MAGIC	Multi Agency Geographical Information for the Countryside
MDA	Major Development Area
NGR	National Grid Reference
NO ₂	Nitrogen Dioxide
NTS	Non Technical Summary
PPG	Planning Policy Guidelines
PPS	Planning Policy Statements
RPG	Regional Planning Guidance
RSS	Regional Spatial Strategy
PCC	Portsmouth City Council
PCCHER	Portsmouth City Council Historic Environment Record
PUSH	Partnership for Urban South Hampshire
SFRA	Strategic Flood Risk Assessment
SINC	Site of Importance for Nature Conservation
SAC	Special Area of Conservation
SEEDA	South East England Development Agency
SPA	Special Protection Area
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TA	Transport Assessment
ZVI	Zone of Visual Influence
WHO	World Health Organisation

Definitions

For ease of reference, the following terminology has been used throughout this Environmental Statement:

Term	Definition
The Proposed Development	As specified in The Application which is the subject of this Environmental Impact Assessment.
The Site	Land area of the Proposed Development (see Figure 1.1).
Application	Hybrid application comprising an outline application for employment uses and a hotel with conference facilities and a detailed application for a new link road to Hulbert Road and a link road with bus-gate to Woolston Road; together with landscaping, infrastructure and associated works' on Dunsbury Hill Farm, Havant.
Applicant	Portsmouth City Council
Environmental Impact Assessment (EIA)	Assessment of the environmental effects of the Proposed Development.
ES	This document.
TA	Transport assessment as presented in an accompanying document.
FRA	Flood risk assessment as presented in an accompanying document.
DAS	Design and Access Statement as presented in an accompanying document.
Borough Council	Havant Borough Council
County Council	Hampshire County Council

1 Introduction

Background to the Proposed Development

- 1.1 On 1st March 2011, Havant Borough Council (HBC) adopted the Havant Core Strategy. Policy CS18 identifies strategic sites that are critical to achieving the Borough's Core Strategy vision, which includes the site at Dunsbury Hill Farm.
- 1.2 The Core Strategy states that "Dunsbury Hill Farm is a key strategic employment site for the borough and the wider sub-region, which will form a new businesses gateway to South Hampshire from the A3(M). The creation of a high quality business and technology park with excellent transport connections will deliver a large number of jobs in close proximity to Leigh Park. It will provide new first class employment floorspace for start-up and growing businesses. It could provide approximately 60,000 square metres of new employment floorspace. This is about a third of the total requirement for new employment in the borough up to 2026." (Core Strategy, Strategic Site Profile, pages 95 and 96).
- 1.3 Atkins Ltd has been commissioned by Portsmouth City Council (PCC) to prepare a planning application for the development of Dunsbury Hill Farm for employment uses and a quality hotel with conference facilities. The application will be a hybrid application, which seeks to secure outline consent for the entire Site and full consent for the access junction and road link. The Core Strategy states that an Environmental Impact Assessment (EIA) leading to the production of an Environmental Statement (ES) is required to support the planning application.

Overview of the Proposed Development

- 1.4 The Site a 33 hectare area of land located to the west of Leigh Park, Havant, as shown in Figure 1.2. The Proposed Development includes 20.2 hectares which will be developed for employment uses and a hotel with conference facilities. The rest of the Site will be developed to provide a comprehensive landscape framework and supporting infrastructure including a new link road.

Legislative Framework

- 1.5 The ES has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (the 2011 Regulations) which transpose the requirements of Council Directive 85/337/EEC, as amended by Council Directive 97/11/EC, into the law of England.
- 1.6 The 2011 Regulations state that planning applications for urban development projects which exceed 0.5 ha in area should be subject to Environmental Impact Assessment (EIA) when they are likely to have significant effects on the environment (Reference 1.1, Schedule 2, Table item 10(b)). Government Circular No 2/99 states that the main aim of the amended Directive is to:

"Ensure that the authority giving the primary consent (the 'competent authority') for a particular project makes its decision in the knowledge of any likely significant effects on the environment. The Directive, therefore, sets out a procedure that must be followed for certain types of project before they can be given 'development consent'. This procedure – known as the Environmental Impact Assessment (EIA) – is a means of drawing together, in a systematic way, an assessment of a project's likely significant environmental effects. This helps to ensure that the importance of the predicted effects, and the scope for reducing them, are properly understood by the public and the relevant competent authority before it makes its decision" (Reference 1.2, para 9).

- 1.7 The Rochdale Case Law (R v Rochdale MBC ex parte Tew [1999 3PLR74] and R v Rochdale MBC ex parte Milne [2001 81PCR27]) establishes the principle that an outline planning application needs to clearly set out the parameters within which the development would take place, to ensure that the planning consent decision is made in the full knowledge of the likely significant effects on the environment of the development.

Habitats Regulations Assessment

- 1.8 The Proposed Development is not located within or adjacent to any Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Ramsar sites. However, the Chichester and Langstone Harbours Special Protection Area (SPA)/Ramsar and the Solent Maritime Special Area of Conservation (SAC) are 3.7 km downstream of the Site. In addition, there may be other European sites that will need to be considered as part of the HRA, depending on the extent of the zone of influence of the proposed development. Within the Habitats Regulations, if a scheme is likely to have a significant effect on a SAC or SPA, it is the responsibility of the 'competent authority' to undertake an assessment (known as an 'Appropriate Assessment') of the scheme in relation to the affected sites.
- 1.9 The whole process of screening for likely significant effects and Appropriate Assessment is referred to as Habitats Regulations Assessment (HRA). The purpose of an HRA is to examine the implications of the proposals in relation to the designated features of interest of the European site(s). The conclusions of the HRA should allow the competent authority to determine whether or not the scheme will have an overall adverse effect on the integrity of the site(s). Although the Habitats Regulations do not specifically apply to Ramsar sites, it is Government policy to treat them equally to SPAs and SACs, and Ramsar features are therefore included within HRAs as necessary.
- 1.10 The competent authority is the authority which grants consent, permission or any other authorisation for a plan or project which is likely to have a significant effect on the site and is not directly connected with or necessary to its management. In this case Havant Borough Council is the competent authority. Natural England, the Government's statutory advisor on nature conservation matters has stated that in their view the development may have a likely significant effect on internationally designated sites, and that an assessment under the Habitats Regulations is required. The advice provided by Natural England is provided in Table 15.1 (in summary) and in Appendix 2.2 and 2.3 (in detail). Section 16 of this ES therefore provides sufficient information to allow an assessment of the scheme under the Habitats Regulations to be carried out.

Structure of the Environmental Statement

- 1.11 This ES comprises three volumes:
- Volume 1 - Main text including Non Technical Summary;
 - Volume 2 - Figures; and
 - Volume 3 - Appendices.
- 1.12 This volume (Volume 1) sets out the findings of the EIA. Chapter 2 explains the EIA process, while Chapter 3 describes the Site and its context. Chapter 4 describes the Proposed Development. Chapter 5 describes the evolution of the Proposed Development and the alternatives considered. Chapters 6-15 provide the topic assessments which set out the likely significant effects of the Proposed Development. Chapter 16 provides information to enable an assessment of the effects of the scheme under the Habitats Regulations. The findings of the ES are summarised in Section 17 which also discusses cumulative effects which are not addressed elsewhere in the ES.

References

- 1.1 The Town and Country Planning (Environmental Impact Assessment) Regulations 2011
- 1.2 Government Circular No 2/99: Environmental Impact Assessment (March, 1999)

2 Environmental Impact Assessment Process

Introduction

- 2.1 This section provides an overview of the approach that has been used to prepare the EIA. It describes the scoping of the ES and consultation activities, and sets out the general methodology which is relevant to all topic assessments. Further detail on topic-specific methodologies is provided in the topic chapters and appendices.

Scoping and Consultation

Scoping

- 2.2 The 2011 Regulations enable a developer to obtain a formal Scoping Opinion from the local planning authority on the scope of the EIA. A Scoping Report was submitted to Havant Borough Council on 4th March 2011.
- 2.3 The environmental issues which were considered to be in the scope of the ES are identified in Table 2.1. The entries marked ✓ indicate that the effects were considered part of the scope, while those marked - were scoped out. The table differentiates between those impacts which could occur during the construction and operational stages of development.

Table 2.1 - Key Environmental Effects Identified during Scoping

Effects	Construction	Operation
Land Use		
Agricultural land take and impacts on agricultural businesses	✓	✓
Development impacts on soil	✓	-
Socio-economic Effects		
- Direct employment generation	✓	✓
- Induced and indirect employment generation	✓	✓
- Effects on local services and amenities	-	✓
Air Quality		
Effects generated by:		
- Dust and particulates	✓	-
- Vehicle exhaust emissions	✓	✓
- Health issues related to overhead power lines	-	✓
Noise and Vibration		
Effects generated by:		
- Road traffic	✓	✓
- Construction activities	✓	-
- Building services	-	✓
- Industrial noise	-	✓
Cultural Heritage		
- Effects on buried archaeology	✓	-

Effects	Construction	Operation
Ground Conditions and Contamination - Effects on soil (see land use above) - Effects on groundwater (see water resources below) - Risk associated with historic landfill and gas pipeline	✓	-
Water Resources and Flood Risk Effects on: - Flood risk - Surface water run-off and quality - Ground water quality - Drinking water supply - Foul water system - Recreational fishing - Restoration of Hermitage Stream	- ✓ ✓ - - - ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓
Landscape and Visual Impact - Visual impact - Landscape impact - Impact of lighting	✓ ✓ -	✓ ✓ ✓
Ecology Effects on: - European Protected Sites - SINCS - Protected species - Habitats, large areas of which will be lost due to land take	✓ ✓ ✓ ✓	- - - -
Waste and Recycling - Construction waste - Operational waste	✓ -	- ✓

2.4 The scoping report was subject to statutory consultation and submitted to the following consultees:

- Havant Borough Council Officers;
- Natural England;
- English Heritage;
- Environment Agency;
- Hampshire Wildlife Trust;
- Hampshire Police;
- Hampshire County Council (HCC);
- Winchester City Council;
- East Hampshire District Council;
- Portsmouth City Council;
- Health and Safety Executive;

- Southern Gas Networks;
- Ofcom;
- DEFRA; and
- Secretary of State for Transport.

2.5 A summary of comments provided by consultees are attached in Appendix 2.2 and 2.3 of Volume 3.

2.6 HBC provided a Scoping Opinion on 18th April 2011 stating that the development falls under the provisions of the EIA Regulations, in particular Schedule 2 (10). The Opinion stated that the project is likely to have significant environmental impacts, based on the character of the project, its location and character of potential impacts, which given the size of the development are likely to be permanent, for instance:

- Additional traffic and transport;
- Noise or vibration, such as from construction work and traffic and in the operational phase from business activities and traffic;
- Ecology, given that the proximity of Sites of Importance for Nature Conservation which variously adjoin or are within 400m of the site and designated sites of national and international importance for nature conservation at Langstone and Chichester Harbours (SAC/SAP/SSSI & Ramsar sites), which are around 3km to the south;
- Landscape and visual changes;
- Air and water impacts both in terms of quality of and drainage patterns;
- The use of natural resources both in the construction and operation phases, including the loss of agricultural land and soils and energy use; and
- Socio-economic; given the proximity to highly-populated urban areas at Havant and Waterlooville.

2.7 In general, the Council confirmed that they were satisfied with the proposed scope of the Environmental Impact Assessment. They requested a chapter on Transport and made some recommendations in relation to the detail of the methodologies.

2.8 Subsequent to this initial stage of scoping, further discussions were held with appropriate statutory and non-statutory bodies during the various component assessments which together comprise the EIA; these are listed where relevant in the following sections of the ES. Issues such as, security and crime in relation to crime, are addressed in the Design and Access Statement.

Further Consultation

2.9 A public consultation strategy was agreed with the Borough Council at the start of pre-application discussions in February 2011.

2.10 The Indicative Masterplan was presented at the following joint Community Boards:

- Leigh Park, Havant & Bedhampton (20/06/11);
- Waterlooville North and South (29/06/11); and
- Warren Park Neighbourhood Forum (22/09/11).

2.11 The Masterplan was also presented at a Development Consultative Forum on 3rd October 2011.

2.12 An unmanned public exhibition was held at The Hub in Leigh Park between 3rd and 18th November and in the Plaza in the Atrium of the Havant Borough Council offices between 18th November and 7th December 2011. Feedback questionnaires were provided at the exhibition.

- 2.13 The proposals were also included on the Havant Borough Council website <http://www.havant.gov.uk/havant-12052> and the PUSH website: http://www.invest-in-portsmouth.co.uk/view_majordevelopment.php?ID=92.
- 2.14 A full report of the consultation process is included in the Statement of Community Involvement which accompanies the planning application.

Assessment Methodology

Iterative Approach to the EIA

- 2.15 The assessment considers the likely significant environmental effects during the construction and operation of the Proposed Development. The methodology and assessment criteria vary from topic to topic and are set out in detail in the specialist sections of this ES.
- 2.16 The assessments have involved interaction between the EIA team and the design team. Following issue of the preliminary plans, assessments were made and mitigation measures were proposed where it was considered that these would reduce an adverse environmental impact or increase an environmental benefit, either during the construction or operational stages of the project. The designs incorporating the agreed mitigation measures were then reissued to the environmental team for the final assessment. Mitigation measures identified by the EIA process are set out in the topic chapters and are summarised in Section 17.

Study Area and Timescale

- 2.17 The geographical coverage of the EIA needs to take account of a number of factors, including the extent of the Site and the nature of the baseline environment. It would not be appropriate to define a single study area for the whole EIA as the spatial extent of the direct and indirect effects arising on each receptor vary. The 'study area' for each topic has therefore been individually defined within each topic assessment.
- 2.18 The timescale of the project is assumed to run from the intended start of construction in 2013 through the intended opening years of the scheme and beyond. The assessment will cover all of the construction period as well as the changes in operational effects. The assessment years for the EIA are as follows:
- Construction - Road 2013, Phase 1 2014-2016, Phase 2 2020-2022; and
 - Operation - 2016 which is the assumed opening year for Phase 1; and 2031 which is Year 15 for Phase 1 and includes the opening of Phase 2 (assumed to be in 2022).

The Do-Minimum Scenario

- 2.19 The environmental assessment process does not merely consider the effects of the Proposed Development against the conditions as they are now, but instead makes the detailed assessment against what is described as the Do-Minimum scenario. That is defined as what could be reasonably expected to have occurred over the same timescale if the scheme did not go ahead. This relates, for example, to changes in traffic conditions, the local environment and development pattern. This Do-Minimum scenario underlies the assumptions made regarding the baseline conditions for the assessment years.

Significance of Effects

- 2.20 The assessment identifies the likely effects that might occur due to the construction and operation of the Proposed Development. Impacts may be adverse/negative or beneficial/positive, direct, indirect, secondary or cumulative, temporary or permanent, short, medium or long term. The nature of each of these effects is defined in Table 2.2 below.

Table 2.2 - Types of Environmental Effects

Effect	Description
Direct	Effects arising immediately as part of the proposed development.
Indirect	Effects not caused immediately by the proposals, but arising as a consequence of it.
Secondary	Additional effects resulting as a consequence of one or more direct effects.
Temporary	Effects which cause a change to the baseline for a limited period of time.
Permanent	Effects causing an irreversible change to the baseline.
Cumulative	Effects which arise from multiple types of effect on a particular receptor. These may overlap spatially or temporally.
Short-term	These temporal scales are defined within each topic assessment at levels appropriate to the receptor being assessed.
Medium-term	
Long-term	
Beneficial/Positive	Effects having a beneficial influence on the environment.
Adverse/Negative	Effects having an adverse influence on the environment.

- 2.21 In general terms the significance of effect is determined by balancing the value and sensitivity of the resource against the magnitude of the impact, or change, and the significance of the resultant effects. Specific methodologies for assessment are described in each topic chapter of the ES.
- 2.22 The overall methodology can be summarised generally, although not necessarily for every topic, as a three-step process:
- The evaluation of the value or importance of a resource and the sensitivity of the receptors;
 - Assessment of the magnitude of the impact of the proposed development on the resource or receptor, be it adverse or beneficial; and
 - Determination of the significance of the effect resulting from impact (of a certain magnitude) on a resource (of a particular value).
- 2.23 Table 2.3 to 2.6 provide generic classifications for environmental value, magnitude of impact and significance of effect. Not all assessment topics will use all of the value or magnitude criteria in these tables, and the matrix approach to deriving the significance may therefore not be appropriate in all cases.
- 2.24 The topic specific criteria for significance rely on reasoned argument, professional judgement and the advice and views of appropriate organisations. Assigning each effect to one of the five significance categories (see Table 2.6) enables different topic issues to be placed upon the same scale of importance to the decision-making process.

Table 2.3 - Environmental Value

Value	Typical Descriptors
Very High	High importance and rarity, international scale and limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Table 2.4 - Magnitude of Impact

Magnitude of Impact		Typical Descriptors
Major	Adverse	Loss of resource and/or quality and integrity; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of / damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Adverse	Some measurable change in attributes quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No Change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.

Table 2.5 - Matrix for Deriving Significance

Environmental Value (Sensitivity)	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight
		No change	Negligible	Minor	Moderate	Major
Magnitude of Impact (Degree of Change)						

Table 2.6 - Significance of Effect

Significance	Typical Descriptors
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a serious change in a site or feature of district importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such issues may become a decision-making issue if leading to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local issues. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Source: Design Manual for Roads and Bridges, Volume 11, Section 2

Significance in Terms of the EIA Regulations

- 2.25 There is also a need to address the significance of effects in the context of whether they are considered to be 'significant effects on the environment' in terms of the 2011 Regulations and hence in terms of the Directives. The following factors should be considered:
- The characteristics of the project in terms of its size, cumulative impacts, use of natural and man-made resources, production of waste, pollution incidents and risk of accidents.
 - The importance of the receiving environment, whether international, national, regional, county or local importance. Designations reflect existing land use, abundance, protected status, quality, population density, ability to absorb the project and regenerative capacity of natural resources. Undesignated land may also be important.
 - Whether the effect is temporary or permanent; if temporary, its duration.
 - The scale of the change following mitigation or enhancement e.g. the land area, number of people affected and degree of change from the existing situation.
- 2.26 These factors will be considered within the methodologies of the various topic assessments. An appropriate general approach is to consider all moderate, large or very large effects as 'significant' in this wider sense.

Residual Impacts and Conclusions

- 2.27 Impacts of the development remaining following the implementation of available mitigation measures are known as 'residual impacts'. These are set out for each of the potential impacts, and their significance level identified.

Cumulative Effects

- 2.28 EIA legislation seeks that a project assessment should have regard to the accumulation of effects with other projects:
- They are caused by the sum of past, present and reasonably foreseeable future actions;
 - They are the total effect, including direct and indirect effects, upon a given environmental resource, ecosystem or human system of all actions taken regardless of the organisation responsible for the action;
 - They may arise from the accumulation of similar effects or the synergistic interaction of different effects; or
 - They may arise over a longer timescale than individual project impacts.
- 2.29 Cumulative effects can result from incremental changes caused by the interactions between effects within a project and/or the interaction with the effects from other developments. Cumulative effects are considered in the following ways:
- Multiple effects from the project, and from different projects of the same or similar type, upon the same resource; such as the effect on a single community of noise from several sources;
 - Different multiple effects from the project, and from other projects, upon the same resource; such as damage due to hydrological change affecting several sites of the same habitat; and
 - Incremental effects arising from a number of small actions, including ongoing maintenance operations, having developed or developing over time.
- 2.30 The topic assessments address cumulative effects within the topic where appropriate. Cumulative effects across different topics are addressed in Section 17.

Inter-relationship Effects

- 2.31 The inter-relationship of impacts on the same receptor has been taken into account. These occur where a number of separate impacts, e.g. noise and air quality affect a single receptor such as fauna. The inter-relationship between aspects of the Proposed Development has been assessed and details provided as to how inter-relationships will be assessed in order to address the environmental impacts of the proposal as a whole.

Transboundary Effects

- 2.32 Transboundary effects refers to any likely significant effects that the development may have on the environment of another Member State of the European Economic Area such as discharges to the air and sea and to potential impacts on migratory species. Given the nature and size of the development, it is not expected that transboundary effects will occur and therefore, the identification of these effects are not relevant to this development.

3 Site Description and Context

Site Description

- 3.1 The Site is located on undeveloped land between Waterlooville and Leigh Park on the north western side of Havant Borough, as shown in Figure 1.2. The Site lies immediately to the east of the A3(M) motorway Junction 3, and the A3(M) runs along the western edge of the Site.
- 3.2 The residential area of Waterlooville lies to the west of the Site, while the Leigh Park estate lies to the east. Open countryside consisting of blocks of woodland and agricultural fields lie to the north of the Site. There is a further area of woodland and agricultural fields to the south of the Site, with superstores located further south on Purbrook Way.
- 3.3 The slip road leading off the A3(M) is the B2150 Hubert Road, which runs on the western side of the Site, and is proposed to provide access for the Proposed Development (see below).
- 3.4 The Site comprises a series of extensive open fields enclosed with established hedgerows. It is dissected across the north east corner by Park Lane which connects Waterlooville with the Leigh Park estate. The Site slopes gently from north to south, down to the Hermitage Stream which runs on the south western side of the Site from Waterlooville to Leigh Park. A 50m section of the Stream is canalised where it runs eastwards from the A3(M). The Stream is located within Flood Zone 3 and is subject to fluvial flooding.
- 3.5 Belts of woodland lie to the south and west of the Site which are identified as Sites of Importance to Nature Conservation (SINCs), namely Beech Wood East, Cherry Tree Row and Bushy Lease. There are a number of trees located within and adjacent to the Site.
- 3.6 High voltage power lines and a mains gas pipeline run through the Site along the eastern side.
- 3.7 The Site is owned by Portsmouth City Council (apart from a small area of land adjacent to Hulbert Road which is in the ownership of the Department of Transport). The majority of the land is let to two agricultural tenants.
- 3.8 The environmental characteristics of the site are set out under topic headings in more detail in Sections 6-15.

Planning History and Strategic Context

- 3.9 A site at Dunsbury Hill Farm was first allocated for employment uses in the Revised Deposit Draft Havant Borough District-Wide Local Plan, February 2002. The justification for additional employment land within the Local Plan was based on two important issues:
 - A serious lack of supply of good quality employment sites to attract inward investment and provide for expansion of existing businesses; and
 - Problems in the Havant economy evidenced by high out-commuting, higher than average unemployment (in some wards) and an over dependence on traditional manufacturing.
- 3.10 The Partnership for Urban South Hampshire (PUSH) has developed a Sub-Regional Strategy for South Hampshire under the South East Plan (Reference 3.1) which is underpinned by a goal to improve the sub-region's economic performance. PUSH recognises Dunsbury Hill Farm as key strategic employment site.
- 3.11 The Regeneration Strategy for Havant Borough and the Leigh Park Strategic Framework (July 2006) identified Dunsbury Hill Farm as a major development opportunity. The Site is important because it will deliver a considerable number of jobs next to Leigh Park which is a priority area for regeneration, as well as providing space for start-up businesses. Themes one and three within the Borough's Strategy specifically deal with creating a diverse and dynamic business base and

creating the right conditions for growth. The key actions that flow from these themes include business creation and new jobs. Dunsbury Hill Farm is central to the delivery of these targets.

- 3.12 A masterplan for a business park at Dunsbury Hill was produced and supported by an ES which was published in February 2003. The masterplan was considered as part of the Local Plan Inquiry held between November 2002 and June 2003. The Inspector's report of 6th May 2004 noted that *"some development with a reduced volume and spread of building could be accommodated at Dunsbury Hill Farm whilst ensuring the retention of the Strategic Gap function. However, in the absence of any information that a reduced scheme would be viable it is concluded that the land should revert to the Strategic Gap designation."*
- 3.13 A study was consequently commissioned to revise the masterplan to address the comments made by the Inspector so that the site could be re-submitted into the Local Plan as a modification. This assessment is detailed in a report by Rummey Environmental Ltd, 'Dunsbury Hill Farm, Siting of Employment Allocation in the Strategic Gap, October 2004'.
- 3.14 The site was subsequently included in the Havant Borough District-Wide Local Plan (adopted by the Borough Council in September 2005) as an Employment Site under Policy EMP 1.4 - Land at Dunsbury Hill Farm, Park Lane, Havant/Waterlooville. In June 2007 the 'Dunsbury Hill Farm Development Brief' was produced by the Borough Council's Planning Policy and Development Teams.
- 3.15 A 20.2 hectare site at Dunsbury Hill Farm was subsequently included within the Havant Borough Core Strategy, which was adopted on 1 March 2011. Policy CS18 Strategic Site Delivery identifies strategic sites that are critical to achieving the Borough's Core Strategy vision, and provides developer requirements for the site at Dunsbury Hill Farm.

Summary of Planning Policy

- 3.16 As part of the EIA process, the environmental specialists have been made aware of relevant policies. This has ensured that the planning policy context for the development is known and reflected in the execution of the EIA. This approach ensures that the design of the Project has evolved in an awareness of planning policy and that the design and control measures proposed within the ES have been developed in an awareness of the compliance standards and criteria specific to Havant.
- 3.17 The Development Plan for the site consists of:
- The South East Plan; and
 - The Havant Borough Core Strategy.
- 3.18 A range of national and regional planning policy documents, as well as additional local documents, also include planning policy which will be material considerations in the determination of the planning application for the proposed development. Relevant planning policy is reviewed in detail in the Planning Supporting Statement which supports the planning application.

National Planning Guidance

- 3.19 The draft National Planning Policy Framework was published on 25 July 2011. It is a key part of the Coalition Government's reforms which aim to make the planning system less complex and more accessible, and to promote sustainable growth.

Draft National Planning Policy Framework (NPPF)

- 3.20 The draft NPPF contains a number of references to the presumption in favour of sustainable development and, the need to support economic growth through the planning system. It defines Sustainable Development as:

- **Planning for prosperity (an economic role)** - use the planning system to build a strong, responsive and competitive economy, by ensuring that sufficient land of the right type, and in the right places, is available to allow growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure.
- **Planning for people (a social role)** - use the planning system to promote strong, vibrant and healthy communities, by providing an increased supply of housing to meet the needs of present and future generations; and by creating a good quality built environment, with accessible local services that reflect the community's needs and supports its health and well-being.
- **Planning for places (an environmental role)** - use the planning system to protect and enhance our natural, built and historic environment, to use natural resources prudently and to mitigate and adapt to climate change, including moving to a low-carbon economy (para 10).

- 3.21 The current national planning policy framework is contained in a series of planning policy statements and complementary guidance, of which the most relevant are as follows:

Planning Policy Statement 1: Delivering Sustainable Development (2005)

- 3.22 PPS1 ensures better integration of all strategies and programmes to support the government's aim for sustainable economic development including provision of infrastructure and services and promotion of investment opportunities. PPS1 highlights the importance of high quality and inclusive design to create mixed and integrated developments.

- 3.23 Part 5 of PPS1 highlights that planning should facilitate and promote sustainable and inclusive patterns of urban and rural development by:

"making suitable land available for development in line with economic, social and environmental objectives to improve people's quality of life; ensuring that development supports existing communities".

Planning Policy Statement: Planning and Climate Change - Supplement to Planning Policy Statement 1 (2007)

- 3.24 The PPS1 Supplement supports PPS1 by outlining how planning should contribute to reducing emissions and stabilising climate change. In doing so Local Authorities should prepare an appropriate statement and integrate a response to climate change in the Regional Spatial Strategy. The statement recognises the need to monitor and review progress to secure action to tackle climate change.

- 3.25 The PPS1 Supplement confirms that tackling climate change is a key Government priority for the new planning system and central to positive planning.

Planning Policy Statement 4: Planning for Sustainable Economic Growth (2009)

- 3.26 The Government's overarching objective is sustainable economic growth, the key relevant policies in PPS4 include:

- **Policy EC2: Planning for Sustainable Growth** - the Policy ensures development has a clear economic vision and strategy and proactively encourages sustainable economic growth identifying priority areas with high levels of deprivation to be prioritised for regeneration investment. The Policy supports existing business sectors and promotes a flexible policy in changing economic circumstances. It positively plans for the location, promotion and expansion of clusters of networks of knowledge driven or high technology industries whilst prioritising previously developed land suitable for re-use and key distribution networks. At the regional level, the Policy seeks to disaggregate minimum job targets to local authority level

and at the local level, promotes a broad range of economic development, including mixed use.

- Policy EC10: Determining Planning Applications for Economic Development emphasises that planning applications for economic development should be assessed by considering high quality inclusive and sustainable design, accessibility to a choice of means of transport and the impact on economic and physical regeneration in the area.

Planning Policy Statement 5: Planning for the Historic Environment (2010)

- 3.27 PPS5 sets out planning policies relating to the conservation of the historic environment. It classifies 'heritage assets' as all those parts of the historic environment that have significance because of their historic, archaeological, architectural or artistic interest. Its policies cover heritage assets which are designated and those which are undesignated. Policies relate both the treatment of the assets themselves and their settings, both of which are a material consideration in development management decision making.
- 3.28 The policies in PPS5 are based on the principle that the historic environment and its heritage assets should be conserved and enjoyed for the quality of life they bring to this and future generations. Heritage assets should be put to appropriate uses consistent with their conservation and with policies on climate change, and should be employed in place shaping and in enhancing local character (HE1/3).
- 3.29 Policies also recognise that decisions are based on the nature, extent and level of significance of heritage assets, and on a level of information proportionate to the importance of the asset. There is a presumption in favour of conserving designated assets and their settings, as well as those assets and their settings which merit designation but have not yet been formally assessed (HE9).
- 3.30 Where there will be substantial harm to or total loss of significance of a designated asset, consent may be refused unless it is demonstrated that i) the substantial harm to or loss of significance is necessary in order to deliver substantial public benefits, or ii) the nature of the asset prevents all reasonable uses of the site, no viable medium term use can be found, conservation through grant funding is not possible, and the loss is outweighed by the benefits of bringing the site back into use (HE9.2).

Planning Policy Statement 9: Biodiversity and Geological Conservation (2005)

- 3.31 PPS9's overarching aim is to ensure that planning, construction, development and regeneration should have minimal impacts on biodiversity and enhance it wherever possible. In moving towards this vision, the Government's objectives for planning are:
- To promote sustainable development;
 - To conserve, enhance and restore the diversity of England's wildlife and geology; and
 - To contribute to rural renewal and urban renaissance.
- 3.32 In particular, the planning system has a significant part to play in ensuring that developments takes account of the role and value of biodiversity in supporting economic diversification and contributing to a high quality environment.

Planning Policy Statement 10: Planning for Sustainable Waste Management (2011)

- 3.33 The overall objective is to protect human health and the environment by producing less waste and by using it as a resource wherever possible. The Government aims to break the link between economic growth the environmental impact of waste.

Planning Policy Guidance 13: Transport (2001)

- 3.34 This document aims to integrate planning and transport at the national, regional, strategic and local level and to promote more sustainable transport choices:
- 3.35 The objectives of this guidance are to integrate planning and transport at the national, regional, strategic and local level to:
- Promote more sustainable transport choices for both people and for moving freight;
 - Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling; and
 - Reduce the need to travel, especially by car.
- 3.36 The Policy supports the maximum use of the most accessible sites, such as those in town centres and other which are, or will be, located close to major transport interchanges.
- 3.37 Development comprising jobs, shopping, leisure and services should offer a realistic choice of access by public transport, walking, and cycling. Such development should not be designed and located on the assumption that the car will represent the only realistic means of access for the vast majority of people.

Planning Policy Statement 22: Renewable Energy (2004)

- 3.38 The Statement outlines the Government's policy, as set out in the Energy White Paper (2003). The overall aim is to put the UK on the path to reduce its carbon dioxide emissions by some 60% by 2050, with real progress by 2020, and to maintain reliable and competitive energy supplies. Renewable energy is seen as vital to facilitating the delivery of the Government's commitments on both climate change and renewable energy.
- 3.39 The Document sets out the national and regional targets and locational considerations. In particular, local planning authorities and developers should consider the opportunity for incorporating renewable energy projects in all new developments and potential impacts.

Planning Policy Statement 23: Planning and Pollution Control (2004)

- 3.40 The overall aim of PPS23 is to ensure the sustainable and beneficial use of land.
- 3.41 The Statement advises:
- Any consideration of the quality of land, air or water and potential impacts arising from development, possibly leading to health impacts, is capable of being a material planning consideration, in so far as it arises or may arise from or may affect any land use;
 - The planning system plays a key role in determining the location of development which may give rise to pollution, either directly or indirectly;
 - The controls under the planning and pollution control regimes should complement rather than duplicate each other;
 - The presence of contamination in land can present risks to human health and the environment, which adversely affect or restrict the beneficial use of land but development presents as opportunity to deal with these risks successfully; and
 - Contamination is not restricted to land with previous industrial uses, it can occur on green field as well as previously developed land and it can arise from natural sources as well as from human activities.
- 3.42 The risks of contaminated land on site are considered to be low due to the previous land use. Any pesticides or fertilizers previously on site are unlikely to persist in the environment.

- 3.43 The PPG specifies that construction and maintenance activities in or near water have the potential to “cause serious pollution [...] on the quality and quantity of the water”. In England, Northern Ireland and Wales, works within 10m of a main river watercourse or flood defence are considered to have the potential to impact on the bed and banks of a watercourse or of a wetland (PPG).

Planning Policy Guidance 24: Planning and Noise (1994)

- 3.44 The document sets out guidance on how to minimise the adverse impact of noise without placing unreasonable restrictions, costs and administrative burdens. Measures to mitigate the impact of noise include engineering, lay-out and administrative by limiting the operating time of source.
- 3.45 Special consideration is given to the natural environment including SSSI, RAMSAR and AONB sites. The effect of noise on the enjoyment of other areas of landscape, wildlife and historic value should also be taken into account.

Planning Policy Statement 25: Development and Flood Risk (2010)

- 3.46 A revised version of PPS25 was published in March 2010 and sets out national planning policy on flood risk and new development.
- 3.47 In areas at risk of river or sea flooding, the guidance states that, preference should be given to locating new development in Flood Zone 1 - defined as land with less than 1 in 1000 annual probability of river or sea flooding in any year. Although all uses of land are appropriate in this zone, developers and local authorities are advised to seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development and the appropriate application of SUDs techniques (para 17 and Annex D).

Regional Planning Policy

Regional Spatial Strategy for the South East of England (2009)

- 3.48 The Havant Borough Core Strategy (Reference 3.2) was prepared in the context of Regional Planning Guidance for the South East (RPG9). The latest Regional Spatial Strategy, the South East Plan was published in May 2009 and replaced the Regional Planning Guidance for the South East (RPG9). On 6th July 2010, the Secretary of State for Communities and Local Government announced the revocation of Regional Strategies (under s79(6) of the Local Democracy Economic Development and Construction Act 2009) with immediate effect, whereby strategic planning and infrastructure issues will forthwith be addressed by local rather than regional authorities. The legality of this decision was successfully challenged in the courts and thus at the time of writing, Regional Spatial Strategies still form part of the development plan. However the Secretary of State expects planning authorities and the Planning Inspectorate to have regard to the Government’s intention to abolish Regional Strategies as a material consideration in planning decisions.
- 3.49 Core objectives pertinent to the development proposal include:
- A sustainable balance between planning for economic, environmental, and social benefits, to help improve the quality of life for everyone in the South East region;
 - Economic growth and competitiveness in the region will be sustained, with Gross Value Added (GVA) in the region increased by 3% per annum over the period 2006-2016;
 - New initiative to tackle skills deficits will be promoted;
 - Economic and social disparities within the region will be reduced; and
 - Adequate infrastructure will be provided in a way that keeps pace with development.

3.50 Regional planning policy is provided by the South East Plan. The key policies are summarised below:

3.51 Strategic policies include:

- SP4 Regeneration and Social Inclusion - The Policy highlights the joint workings between local authorities and other national, regional and local partners to align policies and programmes to reduce significant spatial disparities in socio-economic deprivation across the region. The Policy seeks to address extensive regeneration needs within the sub-region of South Hampshire and implement appropriate actions.

3.52 Cross cutting policies:

- Policy SS1: Achieving Sustainable Development - The strategy outlines a set of objective and refers to the guiding principles of The UK Sustainable Development Strategy and several Government policy statements. In particular, the Spatial Development Strategy seeks to ensure that development respects environmental limits by seeking net environmental gains wherever possible or at least avoiding harm, or minimising, mitigating and/ or compensating for that harm.
- Policy CC1 Sustainable Development - The principal objective of the Plan is to achieve and to maintain sustainable development in the region. In accordance with this, greenhouse gas emissions should be minimised and the physical and natural environment should be conserved and enhanced.
- Policy CC2 Climate Change - The policy outlines the importance of measures to mitigate and adapt to current and forecast effects of climate change. Behavioural change is considered essential in implementing this policy and the measures identified.
- Policy CC4 Sustainable Design and Construction - The design and construction of all new development, and the redevelopment and refurbishment of existing building stock will be expected to adopt and incorporate sustainable construction standards and techniques.
- Policy CC6 Sustainable Communities and Character of the Environment - Actions and decisions associated with the development and use of land will actively promote the creation of sustainable and distinctive communities.
- Policy CC7 Infrastructure and Implementation - The scale and pace of development will depend on sufficient capacity being available in existing infrastructure to meet the needs of new development. Where new development creates a need for additional infrastructure a programme of delivery should be agreed before development commences.
- Policy CC8 Green Infrastructure - Local Authorities will work together to plan, provide and manage connected and substantial networks of accessible multi-functional green space. Networks need to be planned and managed to deliver the widest range of linked environmental and social benefits including biodiversity, landscape, recreation, water management, social and cultural benefits.

3.53 Economic development policies:

- Policy RE1 Contributing to the UK's Long Term Competitiveness - the regional planning body and regional development agency (SEEDA) (Reference 3.3) will work with local authorities to seek to ensure that the spatial requirements for market flexibility are fully met in all parts of the region, whilst respecting the principles of sustainable development.
- Policy RE2 Supporting Nationally and Regionally Important Sectors and Clusters - The development of nationally and regionally important sectors and clusters will be supported through collaborative working between local authorities, local strategic and economic partnerships, SEEDA and the business community.

- Policy RE3 Employment and Land Provision - In preparing local development documents (LDDs), local authorities will have regard to strategic and local business needs and the relevant sub-regional strategy. Interim job numbers in south Hampshire are set at 59,000 (2006-26) and at 14,500 (2006-16) in the rest of Hampshire.
- Policy RE4 Human Resource Development - the Policy seeks to ensure there is a coordinated approach to skills provision which meets business requirements and the workforce is equipped to access and benefit from existing and new opportunities in the labour market.
- Policy RE5 Smart Growth - The Policy promotes smart economic growth throughout the region, to increase the region's prosperity whilst reducing its ecological footprint. In particular, there will be a focus on raising the level of innovation, creativity and global competitiveness, and encourage flexible working practices.
- Policy RE6 Competitiveness and Addressing Structural Economic Weakness - the Policy seeks to maintain and enhance the competitiveness of the most economically successful parts of the region and also to address structural economic weakness to release the economic potential of areas which are under performing.

South Hampshire is defined as a sub-region whereby commercial sites with a good prospect of employment will be protected. The Policy supports mechanisms to unlock and bring into use sites with economic development potential guided by sustainable development principles. SEEDA and local partners will promote the take up of ICT to stimulate increased enterprise and innovation.

3.54 Transport policies:

- Policy T2 Mobility Management - The Policy outlines a need to achieve a rebalance of the transport system in favour of sustainable modes based on an integrated package of measures.
- Policy T5 Travel Plans and Advice - Local Authorities must ensure that their local development documents and local transport plans identify those categories of major travel generating developments, both existing and proposed.

3.55 Natural resource management policies:

- Policy NRM1 Sustainable Water Resource and Groundwater Quality - Water supply and ground water will be maintained and enhanced through avoiding adverse effects of development on the water environment. Demand management and water resource development should be undertaken.
- Policy NRM2 Water Quality - Water quality will be maintained and enhanced through avoiding adverse effects of development on the water environment.
- Policy NRM4 Sustainable Flood Risk Management - This policy is in accordance with PPS25 and states inappropriate development should not be allocated or permitted in flood zones 2 and 3, areas at risk of surface water flooding, or area with a history of groundwater flooding, or where it would increase flood risk elsewhere, unless there is an over-riding need and absence of suitable alternatives.
- Policy NRM5 Conservation and Improvement of Biodiversity - The policy aims to avoid a net loss of biodiversity, and actively pursue opportunities to achieve a net gain across the region. The highest level of protection must be given to sites of international nature conservation importance.
- Policy NRM7 Woodlands - The policy seeks to support the implementation of the Regional Forestry and Woodland Framework, ensuring the value and character of the region's

woodland are protected and enhanced. The policy promotes the effective management and where possible, the replacement of woodland.

- Policy NRM9 Air Quality - The Policy aims to contribute to sustaining the current downward trend in air pollution in the region. This includes seeking improvements in air quality so that there is a significant reduction in the number of days of medium and high air pollution by 2026. The Policy seeks to ensure consistency with Air Quality Management Plans and assess the potential impacts of new development and increased traffic levels on internationally designated nature conservation sites, and adopt avoidance and mitigation measures to address impacts.
- Policy NRM10 Noise - Measures to address and reduce noise pollution will be developed at regional and local level through traffic management encouraging high levels of sound proofing and screening as part of sustainable housing design and construction.
- Policy NRM11 Development Design for Energy Efficiency and Renewable Energy - The Policy promotes and secures greater use of decentralised and renewable or low-carbon energy in new development. This includes setting ambitious but viable proportions of energy supply for new development required to come from sources.

3.56 Countryside and Landscape Management policies:

- Policy C6 Countryside Access and Rights of Way Management - the policy indicates that Public Rights of Way should be maintained, enhanced and promoted. Opportunities and planning for routes within and between settlements should also be identified, to reduce car use for short journeys and to make new multi-functional routes.

3.57 Built environment policies:

- Policy BE1 Management for an Urban Renaissance - The Policy promotes opportunities associated with new development to help provide significant improvements to the built environment. In partnership with other public agencies, the private sector and the local community, the planning authority will seek to establish innovative management arrangements for business parks.
- Policy BE6 Management of the Historic Environment - The Policy supports proposals which protect, conserve and, where possible, enhance the historic environment and the contribution it makes to local and regional distinctiveness and sense of place.

3.58 Policies related to social and community infrastructure

- Policy S1 Supporting Healthy Communities - The Policy embraces preventative measures to address the causes of ill health, such as access to parks, open spaces, physical recreation activity, cultural facilities and healthier forms of transport.

PUSH South Hampshire Sub-Regional Strategy (2005)

3.59 The goal for South Hampshire is to improve its economic performance to at least match the regional average. The target is an increase in Gross Value Added (GVA) of between 3.0 and 3.5 per cent per annum. To support this projected GVA growth rate the following transport related targets were suggested:

- Improve strategic accessibility in general;
- Address bottlenecks;
- Invest in public transport;
- Improve links to London and Heathrow; and
- Increase capacity of Southampton Airport.

- 3.60 Since there is insufficient scope within urban areas and current allocations to meet the long term needs of South Hampshire, further Greenfield housing development is required. PUSH's preferred approach is to concentrate on large proposals, termed 'Strategic Development Areas' (SDAs). These would be model sustainable communities, and would comprise a full range of services and facilities, as well as housing and employment opportunities. PUSH concluded that only two SDAs are required for South Hampshire to help deliver the required number of new homes between 2016 and 2026. Each SDA needs to be of a sufficient size and located within close proximity of one of the two cities, with scope to establish good public transport links to them. The two areas identified for SDAs are to the north and north east of Hedge End (around 6,000 new homes) and to the north of Fareham (around 10,000 new homes).

Local Planning Policy

Havant Borough Core Strategy (2011)

- 3.61 The Havant Borough Core Strategy sets the planning framework for our communities until 2026. The Core Strategy has been prepared working closely with partner organisations, including the Havant Local Strategic Partnership, the Partnership for Urban South Hampshire (PUSH), local communities and agencies. The Strategy underwent three major public consultations and was adopted by Havant Borough Council 1 March 2011.
- 3.62 Dunsbury Hill Farm is allocated as a strategic site under Policy CS18.3 of the Havant Borough Core Strategy adopted in March 2011. The Policy outlines the sites critical to achieving the Core Strategy vision. The Policy replaces the Local Plan allocation under Policy EMP1.4 and requires planning applications for Dunsbury Hill Farm to take into account the details set out in the Development Brief.
- 3.63 Policy CS2 Employment – The Council will seek to accommodate flexibly a net total of 162,000 square metres of new employment floorspace between 2006 and 2026 as follows:
- 75,000 square metres of B1 offices;
 - 45,500 square metres of B2 manufacturing; and
 - 41,500 square metres of B8 warehousing.
- 3.64 Policy CS3 Skills and Employability – The Policy states permission will be granted for development proposals that provide and tackle skills shortages to raise skill levels and provide childcare facilities within or in close proximity to employment sites.
- 3.65 Policy CS6 Regeneration of the Borough – The Policy emphasises the need for development which positively contributes by type of use and design and by its comprehensive approach to the social, economic and/or physical regeneration of the whole borough.
- 3.66 The proposals map outlines the particular focus for each area, as set out below.
- Leigh Park, with particular focus on Leigh Park Centre, improved car parking, public realm and a sustainable mix of uses;
 - A balanced housing market;
 - Supporting healthy lifestyles;
 - Community safety;
 - Connectivity with the rest of the borough; and
 - Training and employment opportunities.
- 3.67 Policy CS11 Protecting and enhancing the special environment and heritage of Havant Borough – the Policy ensures that statutory and non-statutory designated landscape, habitats and features of biological, hydrogeological or geological interest are protected and enhanced. The Policy has particular regard to the hierarchy of nature conservation designations within the borough.

- 3.68 Policy CS13 Green Infrastructure – The Policy promotes the maintenance and management of the network of green infrastructure identified at the sub regional and local levels. The Policy also promotes the creation and incorporation of additional resources to green infrastructure.
- 3.69 Policy CS14 Efficient use of resources – The Policy seeks to locally contribute to the delivery of the PUSH target of 100MW of renewable energy by 2020 for the whole of the PUSH area. Major areas of development must ensure that their on-site renewable energy production is maximised and resource efficiency is maximised.
- 3.70 On completion, unless proven to be financially or technically unviable, non-residential development over 500sqm must also meet the BREEAM standard ‘excellent’.
- 3.71 Policy CS16 High quality design – the Policy seeks to ensure development is designed to a high standard, which helps to create places where people want to live, work and relax. All development should demonstrate that its design responds to and draws inspiration from and respects local context, as well as producing a positive relationship between buildings, street and spaces both existing and proposed.
- 3.72 The Policy promotes inclusive design and seeks to maximise opportunities for mixed use developments, particularly in town and district centres, and encourage higher densities where appropriate.
- 3.73 Policy CS17 Concentration and distribution of development within the urban areas – The Policy promotes the effective use of land in the borough by concentrating and broadly distributing new housing, employment, retail, leisure and other development within and between the five urban areas. The Policy prioritises development on previously developed land.
- 3.74 Policy CS19 Effective provision of infrastructure – The Policy states development will be permitted where it makes the most effective use of existing infrastructure and it is proven that there is a need for additional infrastructure.
- 3.75 The Policy promotes the creative multifunctional use of existing and proposed facilities and safeguards the requirements of infrastructure providers.
- 3.76 The site is identified as a key strategic employment site for the borough and the wider sub-region, which will aims to form a new business gateway to South Hampshire from the A3(M). The site is considered as a major new employment site focused on knowledge-based businesses and a quality hotel with conference facilities.
- 3.77 Policy CS20 Transport and Access Strategy – the Policy seeks to ensure development does not increase congestion and promotes better use of existing transport networks. The Policy seeks to support transport management measures and maintain and improve the range of transport modes accessible to all users.
- 3.78 Policy DM8 Conservation, protection and enhancement of existing natural features – The Policy seeks to ensure development will only be permitted where it protects and enhances local habitats and landscape distinctiveness and ensures the following criteria are addressed:
- Protection of natural features of nature conservation and/or amenity importance on the site;
 - Sympathetic incorporation of existing features into overall design of the scheme;
 - Provision of new landscape works that integrate successfully with the environment and existing natural features; and
 - Maintenance and protection of sequences of greenspaces and visual amenity of green open spaces which contribute to the identity of the borough.

- 3.79 Policy DM10 Pollution - The Policy seeks to ensure development that may cause pollution of water, air or soil or pollution through noise, smell, smoke, fumes, gases, steam, dust, vibration, light, heat, electromagnetic radiation and other pollutants are only be permitted if there are no detrimental affects to receptors.
- 3.80 Policy DM11 Planning for more sustainable travel - The Policy seeks to increase the integration of sustainable travel modes and availability of non-motorised modes by appropriate measures, including:
- Securing on-site and/or off-site interventions that promote integrated travel and access by non-motorised modes;
 - Requiring safe and secure vehicular and cycle parking and turning facilities to adopted standards;
 - Securing appropriate movements to public and community transport (including infrastructure requirements);
 - Proposals for reducing opportunities for informal parking in the area surrounding the development; and
 - Ensuring that new developments are located and designed at the outset to encourage lower vehicles speeds, and safe, permeable, inclusive layouts that integrate with existing pedestrian, cycle and public transport routes.
- 3.81 Policy DM12 Mitigating the impacts of travel - The Policy emphasises the need for new developments to mitigate their travel impact, including the environmental impacts of travel and impacts on amenity, health and climate change.
- 3.82 Policy DM14 Car and cycle parking on development (excluding residential) - The Policy ensure development will only be permitted where it provides parking for cars, motor cycles and cycles in accordance with relevant standards. Parking provision must be appropriately located in relation to the development and be practical for its intended use.

Dunsbury Hill Farm Development Brief (2007)

- 3.83 The Development Brief (Reference 3.3) has been produced by the Borough Council's Planning Policy and Business Development Teams in close consultation with Portsmouth City Council. The Brief has been approved by Havant Borough Council's Planning and Development Services Portfolio Holder and forms the basis of pre-application engagement with the community.
- 3.84 The overarching vision of the Brief is:
- 'To create a high quality Business and Technology Park that will deliver economic and social benefits to Leigh Park and the wider area and respond to the opportunities presented by the global economic market'.*

References

- 3.1 South East Plan or Regional Spatial Strategy for the South East (May 6 2009)
- 3.2 Havant Borough Core Strategy March 2011
- 3.3 Dunsbury Hill Development Brief (2007)

4 Description of Proposed Development

Regulatory Context

- 4.1 The 2011 Regulations require an ES to include, amongst other things:

“a description of the development comprising information on the site, design and size of the development” and also “a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects” (Reference 5.1, Schedule 4, Part II, paras 1 and 2).

- 4.2 As reported in the Design and Access Statement, many of the key influences on the design and size of the Proposed Development were identified during the course of pre-application discussions with the Local Planning Authority and from early engagement with the local community.

Design and Access Principles

- 4.3 As reported in the Design and Access Statement, based on assessment work and feedback derived from consultation with the local community, the following ‘high-level’ design and access principles were established:

- To create character and a sense of place with development design that responds to the site topography and landscape.
- To create a legible environmental setting. The development should be formed by a clear structure to aid movement and identity.
- To create appropriate and effective movement/accessibility throughout the Site. The routes within and connecting to the Site for vehicles, pedestrians and cycles should be designed to ensure high quality and convenient accessibility.
- To ensure that the development provides a strong gateway feature at the entrance to the Site from the A3(M).
- To ensure compliance with the principles of sustainability both in terms of construction of buildings and protection of natural resources.
- To ensure that the highest quality sustainable development is attained in the prevailing commercial market place.
- To promote safety and security.
- To ensure that the road layout and configuration and general mix of uses have regard to potential later phases of development.

Environmental Objectives of the Proposed Development

- 4.4 From site preparation through to construction and operation, environmental considerations form a key element of the proposals. The principal objectives behind these considerations reflect current national, regional and local planning policy which, as discussed in Chapter 3, place a strong emphasis on sustainable development.

Operational Phase

- 4.5 The principal environmental objectives which underpin the operational phase of the Proposed Development are embodied in the design and access principles set out above.

Construction Phase

- 4.6 Site preparation and construction activities will be undertaken in such a way as to reduce disruption to people, property, the natural environment and archaeological resources. This will be mainly achieved through contract specifications (drawn up in accordance with relevant directives, standards and legislation) and the adoption of good construction management practices. The principal objectives will be to:
- Minimise the use of local roads by HGVs;
 - Control construction noise;
 - Control dust emissions;
 - Minimise the risk of pollution to controlled waters;
 - Minimise the risk of damage (by compaction and smearing) to high quality soils;
 - Protect existing trees and hedgerows which are to be retained as part of the development;
 - Minimise disturbance to protected species and others of conservation importance; and
 - Assess the nature and extent of archaeological deposits, so that significant archaeological losses will be minimised and any losses preserved by record.

Design Approach

- 4.7 The main features of the design of the Proposed Development are described below, outlining the approach which has been adopted toward achieving the environmental objectives embodied in the design and access principles. The principal environmental protection measures are then considered, including those implemented during the construction phase to reduce disruption to people, property, the natural environment and archaeological resources.
- 4.8 Consideration is given below to the key parameters which have been established in relation to movement, land use and building heights which form the legal basis of the outline planning application to Havant Borough Council.

Approach to Planning Application

Hybrid Planning Application

- 4.9 The planning application approach for the development of the Dunsbury Hill employment site will involve the submission of a hybrid planning application, i.e. an application that is part outline and part detailed.

Outline

- 4.10 The outline part of the planning application will cover the entire development site. It will establish the principles of the development and enable the detailed design to evolve within a series of agreed development parameters. The scale of the development will require the whole scheme to be implemented in phases over a period of years. The planning framework, contained in the series of parameter plans, will guide development over future years.

Detailed

- 4.11 The detailed part of the planning application will relate to the access and link road. This requires more detailed treatment for reasons of timing and to demonstrate confidence that the scheme is feasible. This will provide a firm basis for setting the access and key areas of the development in relation to the major highway works.

Key Parameters

- 4.12 The application parameters establish what is being applied for. They are shown in Figures 4.1 (Parameter Plan 1: Movement), 4.2 (Parameter Plan 2: Land Use Framework) and 4.3 (Parameter Plan 3: Building Heights) and summarised in Table 4.1 below.

Table 4.1 - Key Parameters of the Outline Planning Application

Parameter	Content	Purpose
Parameter Plan 1: Movement Framework (Figure 4.1)	New access junction	To connect the Site to the A3(M) via Hulbert Road
	Bus Gate	To connect the site to Leigh Park through a bus only access point
	Link Road	To define the primary circulation route through the Site and the dedicated public transport link
	Existing public right of way (Bridleway 123) retained within the Proposed Development	To maintain and improve the existing bridleway which crosses the Site
Parameter Plan 2: Land Use Framework (Figure 4.2)	Distribution of major land uses (hotel with conference facilities and employment) across two phases	To create a land use mix that reflects the Core Strategy and Development Brief and conforms to current planning/design guidance
	Existing trees and hedgerows which will be retained	To maintain, as far as practical, existing features of nature conservation interest and landscape importance
	Provision of a minimum 150 - 180m wide landscaped gap between the A3(M) and the Proposed Development	To provide a strong landscape structure and buffer between the Proposed Development and the A3(M)
Parameter Plan 3: Building Heights (Figure 4.3)	Maximum building heights.	To determine/limit visual impact and respond to local characteristics, topography and design guidance in line with Development Brief

Amount of Development

- 4.13 The key components of the Proposed Development are set out in Table 4.2 which shows the maximum gross external area (GEA) of commercial and hotel uses.

Table 4.2 - Amount of Development

Land Use (Use Class)	Maximum Amount (GEA* where applicable)
Phase 1	13.2ha
<i>Hotel with conference facilities (C1)</i>	<i>5,574m²</i>
<i>Employment including an Enterprise Centre (B1, B2 and B8)</i>	<i>46,450m²</i>
Phase 1	7ha
<i>Employment (B1, B2 and B8)</i>	<i>15,329m²</i>

* The whole area of a building taking each floor into account

Access

- 4.14 The main vehicular access will be via the primary circulation corridor shown on Parameter Plan 1 (known as the link road) linking the Proposed Development to a proposed new roundabout on Hulbert Road and a new roundabout with Woolston Road.

- 4.15 The design specification for the link road is set out in the Highway Design Report which accompanies this planning application. To summarise the proposals comprise:
- A four arm standard roundabout on Hulbert Road;
 - A lay by off the fourth arm of the roundabout on Hulbert Road;
 - A proposed roundabout on Woolston Road;
 - Two way single lane carriageway between the proposed new roundabouts on Hulbert Road and Woolston Road;
 - A bridge over Hermitage Stream;
 - A 3m wide shared footway/cycleway to the north and south of the link road between the hotel roundabout and Woosilton roundabout;
 - A bus stop in each direction (located within lay bys between the hotel roundabout and the Woolston Road roundabout).
 - A bus gate at the Woolston Road roundabout to prevent access to the Proposed Development by general traffic.

- 4.16 The proposed link road will be a dedicated public transport link between residential areas to the east and west and will form part of the Cross Borough Transport Route.

Employment

- 4.17 Parameter Plan 2 indicates that Phase 1 of the development is located in the southern and central portions of the Site. In line with the requirements of the Core Strategy outline planning permission is sought for 46,450 m² of employment floor space, including an Enterprise Centre and 5,574 m² of hotel floor space and other ancillary uses required to support the employment uses. The location of the Enterprise will be determined at Reserved Matters stage.
- 4.18 Phase 2 of the Proposed Development comprises 7 ha of land and is located in the northern portion of the site. Outline permission is sought for an additional 15,329 m² of employment floor space in Phase 2.
- 4.19 In line with the Core Strategy, no more than 20% of the new employment floorspace will be for B8 storage and distribution and 80% of the new employment floorspace can be split flexibly between B1 business and B2 general industrial uses as defined in the Use Classes Order 2005.

Hotel Development

- 4.20 Permission is sought for a hotel and conference facilities. Parameter Plan 2 indicates that this facility will be located in the south east corner of the Site to enable the creation of a high quality entrance and landmark feature for the Proposed Development.

Building Heights

- 4.21 The lowest part of the Site lies at approximately 20m AOD and rises to almost 45 metres in the north and peaks at 50m AOD on the crown of the hill, to the north of the Site boundary. As illustrated on Parameter Plan 3 (Figure 2.3), rooflines of buildings within Phase 1 will be below the 40m contour to exploit the screening effect of Beech Wood and planting alongside the A3 (M) corridor.
- 4.22 Phase 2 rooflines will be below the 45m contour to ensure that Dunsbury Hill and Bell's Copse and the planting to the east of Park Lane Stream will screen views into the Site.
- 4.23 As the Site increases in elevation, the building heights will correspondingly drop across both phases. The average storey height for Phase 1 is three to four storeys with up to five storeys for the hotel development, which is in the lowest part of the Site, to enable the creation of a landmark feature. Phase 2 is predominantly two storey decreasing to one on the most elevated slopes. (Storey heights are generally 3 to 4 metres for conventional office uses and 6 to 10 metres for warehouse and storage buildings).

Landscape

- 4.24 The Parameter Plans illustrate a 150 - 180m wide gap between the A3(M) and the Proposed Development to provide a strong landscape buffer between the Proposed Development and the motorway. Havant Borough Council has confirmed that although this gap should be free from development, essential road infrastructure can be located here.

Sustainable Urban Drainage (SUDS)

- 4.25 SUDS infrastructure to control surface water run-off will be located throughout the Proposed Development.

Key Principles

- 4.26 This section sets out some guiding principles which applications for reserved matters will be required to comply with.

Access

- 4.27 The key design principles for the primary circulation corridor (link road) are as follows:

- a tree-lined road;
- provision of access to development plots on both sides of the link road and around the Site via the hotel roundabout;

- 4.28 Reserved matters applications for the Proposed Development will include:

- the precise location and form of the bus gate. Any proposal will need to maintain access for pedestrians and cyclists as well as buses;
- a network of pedestrian / cycle routes to improve links from the existing residential areas and to the wider countryside;
- street lighting between the hotel roundabout and the Woolston Road roundabout.

Employment

- 4.29 Permission is also sought for an Enterprise Centre on approximately 1ha of land and start-up and move-on accommodation.
- 4.30 Ancillary uses to support the employment development will include café's (A3) and small scale retail (A1).
- 4.31 The location and form of these uses will be determined at the detailed design stage.
- 4.32 Proposals for B1(a) uses will be supported by a sequential test to ensure no suitable sites are available in the town centres.
- 4.33 The legal agreement will include a scheme to train local people.

Sustainability

- 4.34 Reserved matters applications will include a site-wide renewable energy strategy to demonstrate how the Proposed Development will achieve BREEAM 'excellent' standard.

Landscape and Ecology

- 4.35 The key design principles for the landscaped areas are as follows:

- provision of woodland 'fingers' extending eastwards into the Proposed Development from Beech Wood;
- management of part of land adjoining the Site (but within PCC ownership) as ecological habitats;

- new tree planting or woodland should be of an appropriate species choice and form to integrate the various parcels of existing woodland;
- new hedgerow planting and interplanting to existing hedgerows should be native hawthorn/blackthorn mix with other native shrub species;
- landscaped amenity areas within the employment units for employee use and to ensure the buildings sit within a landscape setting;
- decanalization of Hermitage Stream. The restoration will result in the naturalisation of approximately 100m of the currently concrete lined channel to south of the A3 (M) road crossing and marginal wetland fringe along the length of the restored channel section.

4.36 Reserved matters applications will include:

- detailed landscape and ecological mitigation strategies;
- a long-term management plan to manage operations within the Site and the adjoining areas which include landscape and ecological mitigation measures;
- design of the buildings and public realm;
- design of a gateway feature;

Surface Water Drainage

4.37 Reserved matters applications will include:

- attenuation ponds at the north eastern edge of the Site;
- a network of gulleys and kerbs (in areas restricted by space), and swales and wet swales (alongside the link road) to collect and convey the run-off to the attenuation ponds.

Phasing and Construction Arrangements

Overview of Phasing

4.38 The Proposed Development is envisaged to be phased as follows:

- Construction
 - Junctions and link road: 2013;
 - Phase 1: 2014-2016;
 - Phase 2: 2020-2022; and
- Operation: 2016 is the assumed opening year for Phase 1; and 2022 is assumed to be the opening for Phase 2.

Construction of the Access Points and Link Road

4.39 Construction will comprise the following sequence of activities:

- Site clearance and topsoil stripping;
- Earthworks (cutting and embankment), structures and bunding;
- Laying of sub-base and kerbing;
- Provision of gullies and drainage;
- Surfacing; and
- Ancillary works (e.g. street lighting, safety fencing), top soiling and landscaping.

4.40 Materials required for the works will be locally sourced, wherever possible. The road has been designed on the basis of balancing the cut and fill required for the works with material arising from

cuttings being used on site e.g. in embankments. If additional fill material is required, the sources of recycled materials will be considered prior to sourcing from local quarries where practicable.

- 4.41 Although precise details of plant required have yet to be determined the following are likely to be required: motor scrapers, bulldozers, dumper trucks and excavators.
- 4.42 The plant required for the construction of the scheme will be determined once the tender process is complete and a Contractor is appointed.

Construction of the Business and Technology Park

- 4.43 The following general staged approach to construction would be undertaken phase by phase. Detailed information on the construction sequence and methods will not be available until contractors are engaged.
- 4.44 Prior to the commencement of construction works, the contractor(s) will produce a series of “construction method statements” covering the range of construction activities to be carried out, including techniques proposed to establish the full complement of temporary, permanent and off-site facilities, all the relevant ancillary infrastructure such as essential drainage and utility infrastructure, form and suitability of development platforms, landscaping, site furnishing and wayfinding.

Stage 1: Advance/Site Preparatory Works

- 4.45 Ecological checks would confirm the absence of flora and fauna prior to vegetation removal, in line with the measures proposed in Chapter 15. Development plot surveying and boundary line pegging would precede the erection of temporary fencing and signage around working areas. Existing public utilities and services would be diverted, if required, and ancillary work areas (i.e. site compound, storage yard, access points and haulage routes) established. Temporary traffic management measures would be installed to control traffic movements and construction traffic.

Stage 2: Earthworks

- 4.46 This stage would involve topsoil stripping, stockpiling and management, together with any necessary bulk earthworks for the treatment, profiling, excavation and formation of platforms for development. The intention would be to achieve an earthworks balance, with only unsuitable material being taken off-site.

Stage 3: Main Construction Works

- 4.47 This stage would involve all substructure and superstructure construction and fit-out works, together with the laying of utilities and services, sub grade preparations and pavement construction for road and car parking, formation and planting of landscaped/open space and finishing treatments e.g. lighting, signposting, site clean-up and removal of temporary drainage, traffic controls, storage areas etc.

Construction Equipment

- 4.48 Standard construction machinery and earthwork equipment would be required for the construction works. A typical inventory of machinery and equipment to be used during construction could include but not be limited to:
- Trucks, HGVs and tippers;
 - Articulated lorries;
 - Tracked excavators;
 - Cranes;
 - Vibratory and rubber-tyred rollers;
 - Cement mixers and bitumen sprayers;
 - Drilling plant and piling rigs;

- Scrapers, backhoes and graders;
- Dozers and compactors; and
- Water bowser(s).

Construction Workforce and Working Hours

- 4.49 The workforce required to construct the Proposed Development would vary in accordance with the type of construction activities being undertaken during the various stages of the construction works. Phase 1 and 2 would have a combined construction period of four years. The Proposed Development could directly support approximately 844 construction jobs over this period.
- 4.50 The proposed construction working hours within the site are likely to be:
- Weekdays (i.e. Monday to Friday): 8am to 6pm;
 - Saturday: 8am to 1pm; and
 - No construction work to be carried out on Sundays or Public Holidays or during night-time hours unless required by HBC to reduce impact on local roads.

Construction Routes

- 4.51 There would be a number of truck movements required to transport various materials, plant and equipment to/from the work areas. The principal haulage routes to/from the site would be agreed with the Highway Authority.

Construction Routes

- 4.52 The principal haulage routes used to transport materials, plant and equipment to/from the work areas will be agreed in advance with the Borough Council and the Highway Authority.

Construction Environmental Management Plan (CEMP)

- 4.53 The contractors will, as part of their planning, produce Construction Environmental Management Plans (CEMPs) to set out the control measures and actions that they intend to apply during construction in response to the relevant issues raised by this EIA. The planning authority may also impose specific practices or requirements through planning conditions and the CEMPs will need to reflect those needs in their content.
- 4.54 The mitigation measures set out below have been extracted from the relevant topic chapters and should inform the CEMP.

Noise Control

- 4.55 The CEMP would assist in the implementation of environmental management mitigation and controls to reduce any negative impact from the construction traffic. Typical measures could include:
- Specific routes defined to the site (this includes all HGV traffic arriving via A3(M) Junction 3;
 - Restrictions to the movement of HGVs to particular times of the day to reduce the impact on vulnerable users, for example school children;
 - Ensure the HGV movements are also spread through the day (whilst avoiding sensitive times) to avoid a large volume arriving or departing together; and
 - Pedestrian warning signing of increased HGV movements.
- 4.56 It is also recommended that where possible the impact is considered in the design and use of materials so that this can be done with the minimum amount of traffic generation, in particular reducing the need for larger vehicles and abnormal loads.
- 4.57 For minimising construction impacts, it may be necessary to employ a combination of quieter plant/equipment in conjunction with good working practices such as careful selection of working hours

and activity durations. In addition, noise barriers and enclosures may need to be considered around some of the fixed plant/activities. During the construction phase, measures should be implemented by way of an enforceable noise management plan. A number of mitigation measures and good working practices are described below;

- Where appropriate noise barriers should be in use throughout the works between noisy activities and noise-sensitive receivers. For example, BS 5228 allows an approximate attenuation of 5 dB to be adopted in the cases where there is a barrier, building or other topographic feature between the source and the receiving position, and the top of the plant is just visible to the receiver over the noise barrier. In situations when the noise screen completely hides the source from the receiver, an attenuation of 10 dB can be assumed. The effectiveness of barriers at distances beyond several hundred metres is assumed to be zero, irrespective of the amount of screening.
- All vehicles and mechanical plant used for the purpose of the works should be fitted with effective exhaust silencers and should be maintained in good and efficient working order.
- All compressors and generators should be 'sound reduced' models fitted with properly lined and sealed acoustic covers which should be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools should be fitted with mufflers or suppressors of the type recommended by the manufacturers and should be kept in a good state of repair.
- Machines in intermittent use should be shut down in the intervening periods between work or where this is impracticable, throttled down to a minimum.
- The site compound and static machines should be sited as far as is practicable from inhabited buildings.
- Where practicable, plant with directional noise characteristics should be positioned to minimise noise at adjacent properties.
- Concrete mixers should not be cleaned by hammering the drums. When handling materials, care should be shown not to drop materials from excessive heights.

- 4.58 The local residents should be kept informed of the progress of the works. Information should include when and where the activities will be taking place and how long they are expected to last. The contractor or company carrying out work on site should appoint a responsible person to liaise with the public. All noise complaints should be effectively recorded, investigated and addressed.
- 4.59 The noise level at the proposed hotel, which may be operational whilst building works are still being carried out, can be reduced by careful planning of the phasing of the construction works.
- 4.60 When the construction methods are established, it is recommended that a more detailed assessment is undertaken to identify the likely noise impacts and to determine the exact nature of mitigation measures. An assessment should be based on the guidance in BS 5228:2009.

Dust Control

- 4.61 Mitigation measures to control dust during construction would be specified within the CEMP. The precise measures would depend on the intended operations and the degree of severity of the dust issue. Typical measures include:
- Regular water-spraying and sweeping of unpaved and paved roads to minimise dust, and remove mud and debris;
 - Minimising the surface area of unmade roads;
 - Using wheel washes and/or shaker bars for vehicles leaving the site where appropriate to minimise the amount of mud and debris deposited on the roads;

- Sheeting vehicles carrying dusty materials to prevent materials being blown from the vehicles whilst travelling;
- Enforcing speed limits for vehicles on unmade surfaces to minimise dust entrainment and dispersion;
- Dampening down of surfaces prior to their being worked;
- Storing dusty materials away from site boundaries;
- Constructing outer faces of stockpiled soils first to provide a barrier between tipping operations which would also act as a windbreak;
- Seeding to grass the outward faces of temporary stockpiles and final embankment profiles;
- Not loading spoil into dump trucks from an excessive height.
- With effective suppression techniques, such as those given above, dust can usually be adequately mitigated.

Protection of Surface Waters and Groundwater

- 4.62 Good construction management practices will be used to minimise the risk of pollution to controlled waters caused by discharges to surface water drains, receiving watercourses and the ground. As required by the Environment Agency in its response to the EIA scoping document, this will include the preparation of a pollution incident response plan.
- 4.63 Key mitigation should include:
- Development of a sediment erosion management plan (pre-construction);
 - The use of sediment nets between the road and watercourses including Hermitage Stream in particular, Park Lane Stream and on-site drains;
 - Any requirement for abstraction licences, dewatering and discharge consent related to construction should be determined through the Environment Agency;
 - Care should be taken to ensure that any building materials are also stored outside of the flood zone.
- 4.64 Other practices should include:
- Storage of fuel, oil and other potential pollutants on bunded hardstanding to contain any spillages;
 - Storage of waste in designated areas, isolated from surface water drains and bunded to contain any spillages;
 - Drainage of sites in accordance with BS 8301: 1985 Code of Practice for Building Drainage and BS 6031: 1981 Code of Practice for Earthworks, to ensure that any discharge to surface water drains and receiving watercourses passes through appropriate interception facilities, such as settlement ponds and silt traps;
 - Regular brushing or scraping of site roads, to minimise washouts of deposits to surface water drains and receiving watercourses.
- 4.65 The precise nature of the practices to be written into the CEMP will take account of the pollution prevention guidelines drawn up by the Environment Agency.

Protection of High Quality Soils

- 4.66 By adopting industry guidance such as the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, the loss of valuable soil assets will be minimised. The quality and

quantity of soil on Site would be maintained by implementing appropriate techniques for stripping, storing and re-use.

- 4.67 General precautions such as identifying working zones and haul routes, no handling soils when wet and minimising trafficking over soils will be followed. Where possible, any topsoil and subsoil will be stripped separately and replaced in the correct order.
- 4.68 This approach would be adopted in a Soil Handling and Management Strategy (SHMS), which would in due course form part of the CEMP.

Protection of Existing Trees and Hedgerows

- 4.69 Mitigation measures incorporated into the CEMP will seek to protect from damage those trees and hedgerows which are to be retained as part of the development. The principal measures will comprise:
- The protection of trees in accordance with BS 5837: 2005 Trees in Relation to Construction - the principles of which will also be applied to hedgerows;
 - The erection of fencing, prior to the commencement of construction activity, around other identified areas of ecological interest;
 - The removal of trees and hedgerows outside of the bird breeding season (March to August inclusive); and
 - The clearance of vegetation in such a way as to minimise damage beyond the area required for the development.

Protection of Archaeological Resources

- 4.70 A comprehensive programme of archaeological mitigation would need to be implemented alongside the construction phases. A suggested staged approach is outlined in Chapter 11. The standards of the excavation will adhere to both local County Council requirements and to the Standards and Guidance of the Institute for Archaeologists.

Protected Species

- 4.71 Mitigation measures relating to protected species (bats, dormice, breeding birds and reptiles) are set out in Chapter 15 below. As a precautionary measure, prior to construction, update surveys will be undertaken to check for the presence/absence of protected species - details of which are also set out in Chapter 15.

Gas Pipeline

- 4.72 In construction phase, consideration should be given to any off-site impacts from the laying of pipelines.
- 4.73 High-pressure pipeline/s are in close proximity to the site. The Pipeline number is P019 with a HP regime and is 1.0m from the proposed building works. Should any work be contemplated it is essential that the restrictions detailed in the report are complied with and also with the document T/SP/SSW22 to protect the plan and equipment for the safety of operatives.

5 Evolution of the Scheme and Alternatives Considered

Regulatory Context

- 5.1 The 2011 Regulations require an ES to include, amongst other things:

“An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects” (Reference 1.1 Schedule 4, Part I, para 2 and Part II, para 4).

The Need for the Development and Alternatives Considered

Havant Borough District-Wide Local Plan

- 5.2 A site at Dunsbury Hill Farm was first allocated for employment uses in the Revised Deposit Draft Havant Borough District-Wide Local Plan, February 2002. The justification for additional employment land within the Local Plan was based on two important issues:
- A serious lack of supply of good quality employment sites to attract inward investment and provide for expansion of existing businesses; and
 - Problems in the Havant economy evidenced by high out-commuting, higher than average unemployment (in some wards) and an over dependence on traditional manufacturing.
- 5.3 As part of the Local Plan development process, HBC carried out a range of studies into the supply of and demand for employment land in the Borough. In addition, SEEDA commissioned work to investigate the potential for regeneration within the South Hampshire area, as part of the Agency's regional development remit.
- 5.4 All of this work considered both the general need for employment land, and also the specific need for it in relation to given sites, so a consideration of alternative options has been integral to the process, and is included in the summary below. The results of these studies are set out briefly in the ES 2003 (para 2.2) (Reference 5.1):
- Background Paper No. 6, 'Employment', produced by HBC as part of the Local Plan process, sets out the relevant background of relatively high unemployment within Havant, the need for employment land, the significant net out-commuting which takes place from Havant (around 10,000 more workers left the Borough than entered it for work in 1991) and also the criteria for selection of sites for employment allocation in the Local Plan. This report observes that *'the opportunity can be provided for people to live as close as possible to their place of work or where travel to work can be undertaken by sustainable modes of transport'*. It notes from a 2000 survey of business property needs (Miller Associates, August 2000) that quantities of available land and floorspace have declined over the last ten years, and also that the quality of the land and floorspace which is available is generally poor. The report concludes that at least 20 ha of new employment land is required in order to encourage existing businesses to expand and remain within the Borough, and also to attract new employment.
 - A number of alternative sites were considered in a study of the A27 Corridor, commissioned by SEEDA and produced by GVA Grimleys and Vail Williams. This study concluded that, whilst other employment sites were available in the Corridor, none provided the opportunities for raising standards and facilitating inward investment that Dunsbury Hill Farm does; other

sites are smaller, with relatively poor infrastructure and environment, and lack the potential to create 'critical mass' in a location which would benefit from new, higher skilled jobs.

- An Industrial Property Market Review prepared for HBC by Hughes Ellard and Vail Williams in July 2000 noted that there was a shortage of larger sites above 8ha, and that this restricted the ability of the Borough to secure inward investment by larger organisations seeking reasonably large plot sizes.
- The Revised Deposit Draft of the Local Plan notes (in paragraph 249) the long standing economic problems of unemployment, out-commuting, decline in the manufacturing sector and shortage of land for employment uses. It also notes (paragraph 253) a 59% fall in the supply of industrial accommodation in the last five years and that new or completely refurbished space makes up 33% of the demand but only 11% of the supply within Havant. In order to combat the social deprivation associated with unemployment and the environmental effects of out-commuting, the Plan seeks to allocate sufficient land to provide for expanding local businesses and also those which wish to move to the Borough. On this basis it allocates the Dunsbury Hill Farm as site EMP 1.10.
- Paragraph 269 of the Plan states that: *'This site is identified as a large, high quality site which will enable the Borough to compete more effectively for inward investment, bringing much need new employment opportunities. The site will also provide attractive opportunities for existing businesses to relocate or expand to new high quality sites and premises which will help to free older poor quality stock for much needed redevelopment and renewal.'*
- Paragraph 282/12 of the Plan states that: *'EMP1.10 is necessary due to the need for a large site, close to a motorway junction, providing the opportunity to create a comprehensively planned, modern business park which can develop an identity and range of facilities for businesses which is attractive to inward investors and expanding local businesses in a way which a scattered number of smaller sites would not be able to do. The site also has the potential for good communications links and the ability to access two large pools of labour, together with the ability to be in close proximity to the Leigh Park area suffering from high levels of deprivation and unemployment. The proximity to these areas also presents the opportunity to provide a sustainable transport link between those two areas in order to lessen the need for the use of the private car when travelling to work. A large site in a single use of this nature also makes it easier to apply overall measures to control transport use, provide new transport services and manage the whole setting, mitigating the impact of the development. The site avoids all SSSIs, AONBs, and SINC's and its location provides the opportunity to create a better managed environment with greater public access and facilities for the greater enjoyment of this countryside setting than exist there at present.'*

- 5.5 In summary, HBC considered that there was sufficient evidence available to justify the allocation of this site on the grounds that all other options have been considered and there were no other sites within Havant suitable for the use proposed or which could be delivered because of the land ownership. The project would contribute to economic development and also (to some extent and indirectly) urban regeneration objectives through the potential release of industrial sites within the urban areas which can be redeveloped. The project would contribute to sustainable development objectives through the proposals for environmental improvements, enhanced management and sustainable transport links to residential areas. In addition it would make job opportunities available in an area with a high degree of out-commuting and unemployment. The site also has access to large pools of labour, in particular Leigh Park which suffers from high levels of deprivation and unemployment.
- 5.6 The site was subsequently included in the Havant Borough District-Wide Local Plan (adopted by HBC in September 2005) as an Employment Site under Policy EMP 1.4 - Land at Dunsbury Hill Farm, Park Lane, Havant/Waterlooville. In June 2007 the 'Dunsbury Hill Farm Development Brief' was produced by HBC's Planning Policy and Development Teams.

- 5.7 The Regeneration Strategy for Havant Borough and the Leigh Park Strategic Framework (July 2006) identified Dunsbury Hill Farm as a major development opportunity. The Site is important because it will deliver a considerable number of jobs next to Leigh Park which is a priority area for regeneration, as well as providing space for start-up businesses. Themes one and three within the Borough's Strategy specifically deal with creating a diverse and dynamic business base and creating the right conditions for growth. The key actions that flow from these themes include business creation and new jobs. Dunsbury Hill Farm is central to the delivery of these targets.

Havant Borough Employment Land Review

- 5.8 The Havant Borough Employment Land Review (February 2010) updates this original analysis and confirms the continued need for a 'stand alone' employment allocation at Dunsbury Hill stating that it "offers huge development potential due to its scale, proximity to the highway network, green field character and public sector ownership (amongst other things). This site represents a key opportunity to deliver major transformational change in the borough – the site will also deliver regeneration benefits on a sub-regional level".
- 5.9 The Employment Land Review concludes that Dunsbury Hill is "a key component of future employment land provision in Havant – and any reduction or delay in delivery at this site will have fundamental impacts on the balance between land demand and supply. It is also considered to be of sub-regional importance and has been identified as a strategic site by PUSH" (para 2.68).
- 5.10 It further supports the important contribution that Dunsbury Hill makes to the employment land offer in a qualitative sense as a new business gateway to South Hampshire from the A3(M) "*If the quantum of development to be delivered were to reduce then this would mean that it would be difficult to identify alternative land that could deliver the same quality of employment accommodation*" (para 2.69).

Havant Borough Core Strategy

- 5.11 A 20.2 hectare site at Dunsbury Hill Farm was subsequently included within the Havant Borough Core Strategy, which was adopted on 1 March 2011. Policy CS18 Strategic Site Delivery identifies strategic sites that are critical to achieving the Borough's Core Strategy vision, and provides developer requirements for the site at Dunsbury Hill Farm.
- 5.12 The Partnership for Urban South Hampshire (PUSH) has developed a Sub-Regional Strategy for South Hampshire under the new South East Plan which is underpinned by a goal to improve the sub-region's economic performance. PUSH recognises Dunsbury Hill Farm as key strategic employment site.
- 5.13 While some people would inevitably travel to work at Dunsbury Hill Farm by car, the proximity of the site to Waterlooville and Leigh Park, and the existing and proposed routes to the site for walking, cycling or public transport mean that there are significant opportunities for non-car based, sustainable travel to work. The Masterplan provides for an east-west public transport corridor, which would be available for use by buses, cyclists and pedestrians, but not for private cars.
- 5.14 A further advantage of a greenfield site of this kind is that it enables the development to be planned in a comprehensive and holistic way, securing for the future a largely green visual break between the settlements, and also providing funds for long term improvement and management of the surrounding areas of nature conservation interest. This could not be achieved by smaller scale or more piecemeal development.

Evolution of the Scheme

- 5.15 A master plan for a business park at Dunsbury Hill was produced and supported by the ES which was published in February 2003. The masterplan was considered as part of the Local Plan Inquiry held between November 2002 and June 2003. The Inspector's report of 6th May 2004 noted that *"some development with a reduced volume and spread of building could be accommodated at Dunsbury Hill Farm whilst ensuring the retention of the Strategic Gap function. However, in the absence of any information that a reduced scheme would be viable it is concluded that the land should revert to the Strategic Gap designation."*
- 5.16 A study was consequently commissioned to revise the masterplan to address the comments made by the Inspector so that the site could be re-submitted into the Local Plan as a modification. This assessment is detailed in a report by Rummey Environmental Ltd, 'Dunsbury Hill Farm, Siting of Employment Allocation in the Strategic Gap, October 2004'.
- 5.17 The Masterplans presented in the Rummey report present three different options for the development of the site designed to address the comments made by the Inspector in his report relating to visual impact from the south bound off slip at Junction 3 on the A3 (M) and development within the Havant Gap. This was achieved by maintaining a 150 metre wide 'undeveloped' corridor between the A3 (M) and development on the site. The landscape mitigation proposals were designed to emphasise the Gap in an east/west direction by providing belts or 'fingers' of woodland extending eastwards from Beech Wood and a landscaped corridor on the east/west spine road. The new woodland serves to create valuable wildlife corridors and a new leisure route linking into Dunsbury Wood and ultimately, Staunton Country Park to the north.
- 5.18 The options presented also indicated how the site could be developed and phased from a 100% reconfiguration of the development originally shown on the published scheme to schemes showing a reduction of development of 25% and 35% respectively. It concluded that the area over which new development regardless of which Master plan is adopted would be visible is quite small.
- 5.19 In conclusion, all options were considered acceptable from a landscape and visual perspective and offered an improvement on the previous Master plan, but to varying degrees according to the area developed in each option.

Do-Minimum

- 5.20 The Do-Minimum scenario would leave the landholding of Portsmouth City Council in its current agricultural form.
- 5.21 This scenario is not considered to be an option due to the site allocation within the Borough Council's Core Strategy.

References

- 5.1 SEEDA 2003, Dunsbury Hill Farm Environmental Statement, January 2003.

6 Land Use

Introduction

- 6.1 The Proposed Development at Dunsbury Hill Farm is sited in an area which predominantly comprises agricultural land. The role of this chapter is to present an assessment of the potential impacts of the proposals on agricultural land quality, including soils; and on the individual farm businesses that are present on, or linked to, the area affected by the development.

Scoping Response

- 6.2 Land use issues raised by respondents to the EIA Scoping Report are summarised in Table 6.1

Table 6.1 - Scoping Response - Land Use Issues

Issue Raised	Respondent
Agricultural land use severance and changes in access should include consideration of any risks of crime to agricultural/ rural businesses and activities.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).

Key Aspects of the Project

- 6.3 The Site is an undeveloped 39ha area that comprises agricultural fields, hedgerows and blocks of woodland. Development on the Site will lead to permanent loss of agricultural land and affect the associated farm businesses. The role of this chapter is to assess these effects and their significance.

Relevant Legislation, Policies and Guidelines

- 6.4 Recent significant events and new policy drivers that provide a basis for the methodology for assessing land use in development schemes are:
- The First Soil Action Plan for England 2004-2006' (March 2004);
 - Planning Policy Statement (PPS7) 'Sustainable Development in Rural Areas' (August 2004);
 - Common Agricultural Policy (CAP) Reform and the New Single Farm Payment (January 2005);
 - UK Government's Department for Environment, Food and Rural Affairs (DEFRA) Strategy for Sustainable Farming and Food (December 2002);
 - DEFRA Strategy for Sustainable Farming and Food - Forward Look: Supporting Economic and Statistical Analysis (July 2006);
 - EC Thematic Strategy on Soil and Related Initiatives (September 2006); and
 - DEFRA Consultation on Draft Soil Strategy for England (March 2008).

Approach to Assessment

- 6.5 The assessment follows the methodology outlined in the Design Manual for Roads and Bridges (DMRB), Volume 11, Part 6 'Guidelines for a Stage 2 Environmental Assessment'. This provides a comprehensive framework for the assessment of impacts on land use of infrastructure developments, such the Dunsbury Hill Farm development.
- 6.6 The range of land use topics that currently require consideration under DMRB Volume 11, Section 2, Part 6 are as follows:

- Demolition of Private Property;
- Loss of Land Used by the Community;
- Effects on Development Land;
- Effects on Agricultural Land;
- Effects on Individual Farm Units; and
- Effects on Waterway Restoration Projects.

- 6.7 The study area for a land use impact assessment is typically defined by the extent of the rural businesses, farms and rural land parcels that the scheme construction and associated works would directly change, plus any others whose access arrangements and infrastructure (such as water supply and drainage) may be affected. In this instance, the study area comprises the Site plus any rural land use immediately beyond the Site that is directly linked to the land within. All such land lies within the boundary of land owned by Portsmouth City Council (PCC).
- 6.8 The assessment is based on desk study and on consultation. Desk study included plans, drawings and proposed mitigation measures; national and local policy guidance; and published soil, climatic, agricultural and geological maps and data. Consultation was undertaken with site landowners PCC and with site land agents Tim Judd and Partners.
- 6.9 Field reconnaissance to assess Agricultural Land Classification was not undertaken. A specialist study of agricultural land classification was undertaken by Soil Environment Services of the majority of the proposed study area in 2002 as part of a previous Environmental Statement (Reference 6.1). This identified that land of Grade 3a and above (best and most versatile) was not present. Approximately 5 ha of land to the south and east of the A3(M) roundabout at Hulbert Road was not included in the study. This land is currently under grazing and woodland land uses and is classified as Grade 4 on the MAFF Provisional Agricultural Land Classification map. In addition, based on the evidence from the specialist field survey, the land borders the wetter, poor quality land on the heavier Windsor soils in the southern part of the study area that was also confirmed as Grade 4.
- 6.10 Landowner liaison to assess the potential impacts of the proposals on rural businesses was not undertaken at the request of PCC. PCC is the landowner and licenses the Site to tenant farmers using short-term farm tenancy contracts. All queries relating to the potential impacts on rural businesses were answered by PCC. The understanding of impacts on the tenant farmers is based on these answers.
- 6.11 A nationally recognised set of standard assessment criteria for effects on agricultural land and farm and other businesses does not exist. A bespoke set of criteria has, therefore, been used for this assessment. This has been developed in the light of relevant European, national, regional and local policies and guidance.
- 6.12 The significance criteria relate to two issues: effects on the national resource of agricultural land quality; and effects on local farm businesses, as set out in Tables 6.2 and 6.3 respectively. These criteria address both magnitude of impact and sensitivity of the resource and have been derived from consideration of the characteristics of the impact and the receptor, as follows:
- Type of impact - direct or indirect;
 - Nature of impact - positive or negative or neutral;
 - Duration of impact - short or long term, reversible or not;
 - Frequency of impact - continuous or intermittent, changing with time or constant; and
 - Geographical context - international, national, regional or local.

Table 6.2 - Significance of Effect on Agricultural Land Quality

Significance	Descriptor
Large	Loss of 20 ha or more of the best and most versatile agricultural land - that is, land classified as grades 1, 2 or 3a under the MAFF ALC system. This follows the approach of Annex B15 of PPG7 as amended March 2001, which stipulated that MAFF had a right to be consulted and hence object to schemes where a significant amount of such land was required for development. This has not been retained in the subsequent PPS7 but nonetheless represents a measure of land loss that has been used in planning issues for 20 years or more.
Moderate	Loss of 10 to 19 ha of best and most versatile agricultural land - grades 1, 2 or 3a - or 50 ha or more of lower quality agricultural land - grades 3b, 4 and 5 under the MAFF ALC system.
Slight	Loss of up to 9 ha of best and most versatile agricultural land - grades 1, 2 or 3a - or up to 49 ha of lower quality agricultural land - grades 3b, 4 and 5 under the MAFF ALC system. A threshold of 10 acres (approximately 4 ha) or more follows the approach of paragraph 6 of the Department of the Environment Circular 71/71 'Development of Agricultural Land'.
Neutral	No loss of agricultural land.

Note: The effects relate entirely to loss of agricultural land relative to the national resource and do not reflect any other inherent characteristics, such as scenic or habitat value.

Table 6.3 - Significance of Effect on Local Farm Businesses

Effect	Criteria
Large	Renders a full-time farm business, including any diversification enterprises, unworkable in its current form, such that it could not continue unchanged; the business would have to change the activities undertaken on the remainder of the holding as well as seeking some form of alternative income. For farms let through short term farm business tenancies, serious loss of rental value (>20%).
Moderate	Changes the workability of a full-time farm business, including any diversification enterprises, but without preventing the business continuing largely as before; there would be reductions in farm income and changes in day-to-day management, such as longer journeys to access severed land parcels. For farms let through short term farm business tenancies, significant loss of rental value (10-20%).
Slight	Affects the workability of a full-time farm business, including any diversification enterprises, but with little change to the business continuing largely as before there would be limited change in farm income and day-to-day management. Range from loss or change to the viability of a part-time farm business, where the income is derived mainly from non-agricultural means and supplemented by the farm income; to very slight impact on farm business that can often be easily compensated for by modifications to management system. For farms let through short term farm business tenancies, small loss of rental value (<5-10%).
Neutral	Affects the farm but does not affect the farm business, including any diversification enterprises. For farms let through short term farm business tenancies, no loss of rental value.

Baseline Conditions

6.13 A description of baseline conditions is presented below. The following are considered:

- Overview of study area physical characteristics that relate to soils and agricultural land;
- Agricultural land classification;
- Existing land use; and
- Land ownership.

Overview

Geology

6.14 The Site is located in the Hampshire Basin, which is an ancient depositional basin of sedimentary rocks. Along the coast, to the south of the Site, the main surface geology is formed by wind-borne deposits (bricksand) and raised marine deposits (silt and silty sand). Further north a series of east-west bands of sedimentary rocks are found, including London Clay, Reading Beds and Upper Cretaceous Chalk. The majority of the Site itself is underlain by the Bognor Sand component of the London Clay formation. The northern and southern parts of the Site are underlain by the London Clay itself, which also lies beneath the Bognor Sand. Further details that relate to the underlying stratigraphy of the Site can be found in association with the geotechnical investigations in Chapter 11.

Relief

6.15 The topography of the study area is low lying and undulating. Within the Site, the land rises slightly to the north, and then the land falls away to the north of the Site.

Climate

6.16 The climatological data are summarised below. They indicate average to reasonably warm conditions for the region with rainfall toward the medium side of the regional average.

Table 6.4 - Summary of climatological data

Factor	Units	Value
Altitude AOD	M	2.0
Accumulated temperature	day °C (Jan-June)	1528.8
Average annual rainfall	Mm	808.0
Field capacity days	Days	176.0
Moisture deficit wheat	Mm	110.9
Moisture deficit potatoes	Mm	104.8

Source: Soil Environment Services, 2002)

Soils

6.17 The 1:250,000 scale Soil Map of South East England identifies the Site as comprising soils of the Wickham 3 and Wickham 4 Associations. A specialist soil survey of the majority of the study area was undertaken by Soil Environment Services (2002). This survey identified relatively lighter Wickham and Kings Newton series soils as predominant in the central area, with relatively heavier Windsor series soils in the south and east of the Site. Overall, these soils are slowly permeable, seasonally waterlogged and have fine silty over clayey and coarse loamy over clayey textures.

6.18 The cultivation of Wickham soils is limited by winter wetness. Ground preparation need to be timed very carefully even where surface wetness is reduced by underdrainage. Autumn ploughing is

essential. Wickham soils poach easily and are inaccessible to machinery in the winter so their use for pasture and disposal of slurry is limited.

Agricultural Land Classification

- 6.19 The 1:250 000 Agricultural Land Classification map of 1976 grades the land as mainly Grade 3, with Grade 4 in the south of the study area. This grading does not provide sub-grades for Grade 3 land and does not account for local changes in ground conditions.
- 6.20 The specialist soil survey (Soil Environment Services, 2002) included agricultural land classification of the majority of the study area. The survey identified Grade 3b land in the central area, with Grade 4 land to the south and east of the Site. The grading reflects a combination of the Soil Wetness Class as IV and the site climatic factor of 176 Field Capacity Days (FCD) per year. This grading is considered by the original survey to be borderline with Class 3b.
- 6.21 No soils are within Grade 3a or above; there are no soils within the study area that are in the 'best and most versatile' category.

Existing Land Use

- 6.22 The land use within the study area largely comprises arable fields, pasture, woodland and areas of rough grassland. The belts of woodland lying to the south and west of the Site are identified as Sites of Importance to Nature Conservation (SINCs). The A3(M) motorway borders the west of the site and the housing area of Waterlooville lies beyond this. The Leigh Park housing area of Havant borders the east of the Site.

Land Ownership

- 6.23 A register of landownership and tenancies has been assembled via consultation with PCC and land agents Ian Judd and Partners.
- 6.24 PCC is the owner of all land within the Site apart from a small area of land adjacent to Hulbert Road within ownership of Department of Transport. The majority of the land is let to two tenants on short-term arrangements that could be terminated at short notice. The two tenancies and their characteristics are summarised in Table 6.5 and the pattern of land holdings is shown in Figure 6.1.
- 6.25 The main tenant within the study area is Mr Elms. Mr Elms currently occupies the majority of the Site within the study area on a short-term Farm Business Tenancy agreement with PCC. The tenancy covers approximately 38 ha and is typically set aside for cereals such as barley which are sown as feed crops with variable success. The tenancy provides a caretaker role for PCC in order to deter other unwanted uses such as travellers and vandals and the land is let at reduced rates to reflect this.
- 6.26 The secondary tenant within the study area is Mr Palmer. Mr Palmer currently occupies a limited area (approximately 3 ha) of extensive pony grazing land off Hulbert Road on a short-term Grazing Licence.

Table 6.5 - Summary of Farms let through Short Term Farm Business Tenancies

Land Holding Figure	Holding Name	Farm Characteristics
6.1	Mr Elms	ca 38 ha Fodder cereals, set aside Custodial role Ancillary farm to Lordington Farm, Chichester
	Mr Palmer	ca 3 ha extensive pony and horse grazing Hobby land - main business is bricklaying and carpentry

Identification and Assessment of Likely Significant Effects

- 6.27 The following effects are assessed against the criteria outlined in Tables 6.1 and 6.2:
- Agricultural land quality; and
 - Local farm businesses.
- 6.28 The assessment of likely significant effects assumes that mitigation measures have been incorporated. The scope for mitigation measures is outlined first.

Scope for Mitigation Measures

Agricultural Land Quality and Soil

- 6.29 The EC Thematic Strategy for Soil and Government thinking set out in the First Soil Action Plan for England 2001-2006 and subsequent draft Soil Strategy for England (March 2008) has moved away from the protection of land towards the sustainable use of soil. Whilst there is no mitigation for the loss of agricultural land per se, it is possible to mitigate for effects of the proposals on the soil resource itself.
- 6.30 The quality and quantity of soil on Site would be maintained by implementing appropriate techniques for stripping, storing and re-use. This approach would be adopted in a Soil Handling and Management Strategy (SHMS), which would in due course form part of the Construction Environmental Management Plan (CEMP).

Local Farm Businesses

- 6.31 The farm holdings within the study area are occupied under short-term tenancies. PCC is able to terminate the contracts with Mr Elms and Mr Palmer at short notice in advance of construction. PCC has indicated that it is their intention not to continue farming operations during the construction phase and for no specific farming operations to occur on the Site or on land linked to the Site (e.g. for access or drainage) during the operation phase. PCC has indicated that any remaining farmland the land to the north and west of the Site will remain as arable and that this will be re-let to Mr Elms or another tenant subject to access being available from the development.
- 6.32 No mitigation for operation of the farm holdings in the study area during the construction or operation phase is therefore required. The land will not be used for agriculture and is not linked to agricultural land that requires mitigation e.g. for access or drainage. No mitigation to support agricultural use of adjacent land is required as part of the Proposed Development.
- 6.33 Mr Elms' tenancy is ancillary to his farm at Lordington Farm, Lordington, Chichester and he has additional farm interests in Romania. The loss of the Site is considered by PCC to have a 'modest' impact on his overall business as it is ancillary to the main farm in Chichester. According to PCC the loss of the tenanted land at Dunsbury Hill will not affect the viability of Mr Elms' business. This evaluation is likely to reflect the ancillary nature of the Site and its occupation in a 'site caretaker' capacity. No mitigation is required.
- 6.34 There are no plans by PCC to replace the land with alternative tenancy locally; however any remaining agricultural land beyond the Site may be re-let by PCC under tenancy agreement subject to access being available. No mitigation is required.
- 6.35 Mr Palmer's tenancy is hobby land. There will be no impact on Mr Palmer's rural business interests. There are no plans by PCC to replace the land with alternative tenancy locally. No mitigation is required.

Assessment of Effects

Agricultural Land Quality: Land Take

- 6.36 The primary impact of the Proposed Development is land take. The total permanent land take from agricultural land is ca 33 ha. In national and regional terms there would be a **permanent adverse effect of slight significance** i.e. land take is up to 33 ha of lower quality land. Thus, the principal residual effect of the scheme is likely to be loss of ca 33 ha of agricultural land, none of which comprises soils in the best and most versatile category.

Local Farm Businesses

- 6.37 The effect on Mr Elms will be **temporary adverse of slight significance**. The Site is ancillary to his wider business and performs a mainly custodial role to deter vandals; there will be a very slight impact on his business.
- 6.38 The effect on Mr Palmer will be **neutral**. Mr Palmer grazes the fields as a hobby and they do not form part of his business.
- 6.39 No farm businesses adjacent to the Site are present. There are no indirect effects, such as on drainage or access, associated with adjacent agricultural land.

Summary

- 6.40 This section presents an assessment of the likely significant effects of the proposals on agricultural land quality, including soils; and on the individual farm businesses that are present on, or linked to, the study area. The assessment is based on desk study and on consultation. All queries relating to the potential impacts on rural businesses were answered by PCC.
- 6.41 A specialist study of agricultural land classification was undertaken by Soil Environment Services (2002) identified that land of Grade 3a and above (best and most versatile) was not present. A small section of land to the south and east of the A3(M) roundabout at Hulbert Road was not included in the study. This land is currently under grazing and woodland land uses and based on the evidence from the specialist survey it is not likely to be of Grade 3a or above.
- 6.42 PCC is the owner of all land within the study area apart from a small area off Hulbert Road owned by Department of Transport. The majority of the land is let to two tenants on short-term arrangements that could be terminated at short notice. The main tenant within the study area is Mr Elms. Mr Elms currently occupies ca 38 ha on a short-term Farm Business Tenancy agreement with PCC. The tenancy is typically under set aside and cereals such as barley which are sown as feed crops with variable success. The secondary tenant within the study area is Mr Palmer. Mr Palmer currently occupies a limited area of ca 3 ha of extensive pony grazing land off Hulbert Road on a short-term Grazing Licence.
- 6.43 The primary impact of the Proposed Development is land take. The total permanent land take from agricultural land is ca 33 ha. In national and regional terms there would be a **permanent adverse effect of slight significance**. The principal residual effect of the Proposed Development is likely to be loss of ca 33 ha of agricultural land, none of which comprises soils in the best and most versatile category.
- 6.44 The effect on Mr Elms will be **temporary adverse of slight significance**. The Site is ancillary to his wider business and there will be a very slight impact on his business. The impact on Mr Palmer will be **neutral**. Mr Palmer grazes the fields as a hobby and they do not form part of his business.

Table 6.6 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Agricultural land quality	Soil Handling and Management Strategy as part of the Construction Environment Management Plan	Land take of 33 ha of agricultural land Permanent slight adverse effect
Local farm businesses	No mitigation required: tenancies will be terminated	No permanent impact on viability of local farm businesses Temporary slight adverse effect (Mr Elms)
Operation		
Agricultural land quality	No mitigation required: permanent land use change	
Local farm businesses	No mitigation required: tenancies will have been terminated	

Reference

- 6.1 Soil Environment Services (2002) Dunsbury Hill Farm Site Agricultural Land Classification. Report for Robert Rummey Associates.

7 Socio-Economic Assessment

Introduction

- 7.1 This section presents an assessment of the potential socio-economic impacts arising as a result of the Proposed Development. The impact assessment is undertaken with consideration to the socio-economic context of the study area in terms of its baseline conditions and the relevant local, regional and national policy documents.
- 7.2 The study area for the purposes of the socio-economic assessment consists of the local authority of Havant and Portsmouth (Reference 7.1). Consideration is also given to the wider sub-regional area of South Hampshire which covers the districts of Eastleigh, Fareham, Gosport, Havant, Portsmouth and Southampton (Reference 7.2).

Scoping Response

- 7.3 Socio-economic issues raised by respondents to the EIA Scoping Report are summarised in Table 7.1.

Table 7.1 - Scoping Response - Socioeconomic, Security and Crime Issues

Issue Raised	Respondent
To improve the outcomes for those living locally it is important that the site offers a range of employment opportunities for them.	S. York, Crime Prevention Officer, Hampshire Police Station (comment as at 21 March 2011 to the original Scoping Report).
During the construction phase, materials such as copper, lead, etc and plant will be vulnerable unless adequate measures are put into place. Due to the size and location of the development it is possible that criminals will travel to the site. It is also likely the site will be visited by local young people during the evenings and overnight who will cause damage and engage in anti-social behaviour.	
It is recommended that security at the site during construction is considered at this stage. Points for consideration are detailed.	
Early consultation with Hampshire Constabulary's Crime Prevention Design Adviser (CPDA) is recommended in the local area.	
Consideration will need to be given as to how to provide for the safety and security of users of additional pedestrian and cycle connection to the development.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 November 2011 to the original Scoping Report).
During construction phase, consideration should be given to likely size of workforce, provision of catering needs and rest facilities. Commuting distance of workforce and implications for accommodation, services and development of skills should be considered.	
During operation, the impact of new employment which includes opportunities for local people, on crime risks should be considered.	
During operation, consideration should be given to implications for local businesses, services and housing in relation to the estimated workforce.	
During construction, vulnerability of plant and materials to theft and anti-social behaviour should be considered.	

Key Aspects of the Project

- 7.4 The Proposed Development would provide 46,450 m² of new employment floor space and 5,574 m² of hotel floor space under Phase 1 and an additional 15,329 m² of new employment floorspace under Phase 2. It would therefore be a major employment generating scheme during both its construction and operational phases.

Relevant Legislation, Policies and Guidelines

- 7.5 This section summarises the key relevant socio-economic policies. This is in order to assess the Proposed Development's alignment to the local, regional and national socio-economic priorities and to consider the extent to which the proposals will contribute to the regeneration and economic development of the study area.

National Policies

Planning Policy Statement 4: Planning for Sustainable Economic Growth

- 7.6 PPS4's overarching objective is sustainable economic growth. To help achieve sustainable economic growth, the key objectives include:
- Building prosperous communities by improving the economic performance of cities, towns, regions, sub-regions and local areas, both urban and rural;
 - Reducing the gap in economic growth rates between regions, promoting regeneration and tackling deprivation; and
 - Delivering more sustainable patterns of development and reducing the need to travel.
- 7.7 PPS4 encourages local planning authorities to adopt a positive and constructive approach towards planning applications for economic development. It states that planning applications that secure sustainable economic growth should be treated favourably.

Sub-Regional and Regional Policies

PUSH Economic Development Strategy (June 2010)

- 7.8 The Economic Development Strategy sets out the ambitions for the PUSH area in the light of substantial changes to the economic and policy environment in recent years. The Strategy's objective is to see everyone sharing in the benefits of a prosperous future, with reduced levels of deprivation and increased levels of labour market participation. It identifies the need to create jobs and tackle unemployment as a particular priority.

Regional Economic Strategy for South East England 2006 - 2016

- 7.9 A key objective of the RES is achieving "smart growth". This includes lifting underperformance through increasing the region's stock of businesses and ensuring the provision of the right type and size of employment space to meet the needs of the region and create the climate for long-term investment through efficient use of land resources.

Local Policies

Havant Borough Council (HBC) Core Strategy

- 7.10 The HBC Core Strategy sets out the framework for future development and growth in the Borough over the period to 2026. In terms of policy guidance, the Core Strategy recognises the necessity to revitalise the economy of the Borough by providing high quality land and buildings for employment development and by promoting development that will help to raise skill levels and employment opportunities.

- 7.11 Support for advanced manufacturing is identified as a priority for the future of the local economy and the Core Strategy also supports the growth of the marine based and tourism sectors. The Core Strategy identifies five strategic sites that are critical to the delivery of the overall vision, Dunsbury Hill Farm being one of them.

Havant Borough Employment Land Review 2010

- 7.12 The Employment Land Review (ELR) identified a large surplus vacancy for B1a office accommodation in the Borough. The high vacancy rate for office accommodation was mainly attributed to the low quality and unsuitability of the vacant office stock however. The vacant supply of industrial (B2) and warehousing (B8) land was found to be in balance with anticipated demand.
- 7.13 In terms of the future supply and demand for employment land in the Borough, the ELR states that meeting demand over the period to 2026 is heavily dependent on two large sites (Dunsbury Hill Farm and Brockhampton West) successfully accommodating their floorspace allocations of 78,200 m². If this level of floorspace cannot be delivered on these sites during the plan period, there will be a significant impact on the demand and supply balance.
- 7.14 The ELR describes the Dunsbury Hill Farm site as the Borough's major 'stand alone' employment allocation offering huge development potential due to its scale, proximity to the highway network, green field character and public sector ownership (amongst other things). The Site is described as representing a key opportunity to deliver major transformational change in the Borough as well as wider regeneration benefits on a sub-regional level.

Policy Context Summary

- 7.15 Economic development and employment creation are identified as key policy objectives at the local, regional and national level. The need to provide high quality land and buildings for employment development is highlighted in both the Havant Core Strategy and the Employment Land Review and Dunsbury Hill Farm is singled out as a strategic site critical for the delivery of the area's economic development and regeneration vision.

Approach to Assessment

- 7.16 The assessment of the socio-economic impacts of the Proposed Development focuses on the number of jobs created and supported by the scheme (both directly and indirectly) as employment creation is expected to be the key output of the scheme and the main rationale for its justification.
- 7.17 During the construction phase, construction jobs are estimated based on the construction costs of the scheme while during the operational phase jobs are calculated based on floorspace by land use. The assessment considers the net additionality of the employment impacts based on the guidance issued by the Homes and Communities Agency.
- 7.18 The socio-economic assessment also considers the scheme's contribution to local and regional socio-economic policy objectives and its impact on the social and economic lives of local people.
- 7.19 The socio-economic impacts of the proposed development are assessed using the criteria outlined in Table 2.6 - Significance of Effect.

Baseline Conditions

- 7.20 Dunsbury Hill Farm is located in the area of Leigh Park, in the north central area of Havant Borough. Leigh Park has a population of about 26,700 with a relatively young age structure. Overall the area suffers from high levels of deprivation. Many of the manufacturing firms that were once based there have now left the area and there is a significant gap between the skills of the local population and the jobs available in the sub-region. Leigh Park District Centre has a high level of vacant retail units and the area is characterised by high levels of social rented housing. The Core

Strategy recognises that addressing the skills gap is a priority for the regeneration of the area and the provision of new employment facilities in the area is equally important.

- 7.21 The study area of Havant and Portsmouth has a combined population of 320,000 while the wider sub-regional area of South Hampshire has a population of 869,000. Both local authorities are ranked in the bottom half of the 2007 Index of Multiple Deprivation, Portsmouth being the 93rd most deprived local authority (out of 354) and Havant the 126th most deprived.
- 7.22 The main employment sectors across Havant and Portsmouth are health (14%), public administration (12%), retail (12%), manufacturing (11%) and education (10%). The single largest employment sector in Havant is manufacturing, accounting for over 15% of all jobs in the Borough. Compared to the wider sub-regional area of South Hampshire and the South East region as a whole, the study area has a lower proportion of jobs in higher-value sectors such as finance and insurance, professional, scientific & technical services and business administration & support services. The above sectors account for 14% of all jobs in the study area compared to 19% in South Hampshire and 20% in the South East and England as a whole.
- 7.23 In total, 12.3% of Havant and Portsmouth residents in employment are classified as managers and senior officials compared to 13.6% in South Hampshire, 18.3% in the South East and 16.1% in England. Furthermore, 37.2% of Havant and Portsmouth residents in employment are classified as being in higher value technical, professional and managerial occupations compared to 41.4% in South Hampshire, 48.1% in the South East and 44.8% in England.
- 7.24 The lower number of high value jobs available across Havant and Portsmouth is largely explained by the low qualification levels of the study area's population. Only 26% of the study area's population aged 16-64 is qualified to NVQ4+ compared to 28% in South Hampshire, 33% in the South East and 30% in England. Qualification levels are particularly low in Havant where only 23% of residents aged 16-64 are qualified to NVQ level 4 or higher.
- 7.25 Reflecting the low qualifications and skills levels of the study area's population, average earnings in Havant and Portsmouth are lower than the regional and national averages.

Table 7.2 - Gross Annual Earnings

Area	Gross Annual Median Earnings
Havant	£24,962
Portsmouth	£25,439
South East	£28,792
England	£26,268

Source: Nomis, Annual Survey of Hours and Earnings

- 7.26 Economic activity rates across Havant and Portsmouth are also lower than the sub-regional and regional averages (77.7% compared to 79.9% and 79.8% respectively) although they are still higher than the national average (76.9%).
- 7.27 In terms of unemployment however, the study area performs better than the sub-region, the region and England as a whole. The unemployment rate across Havant and Portsmouth was 5.9% in 2009, compared to 6.6% for South Hampshire, 6% for the South East and 7.8% for England as a whole. There are considerable differences between the unemployment rates in Havant and Portsmouth however, with Havant having an unemployment rate of 4.1% compared to Portsmouth's 6.9%.

Table 7.3 - Economic Activity and Unemployment Rates

Area	Gross Annual Median Earnings
Havant	4.1%
Portsmouth	6.9%
South East	6.0%
England	7.8%

Source: Nomis, Annual Survey of Hours and Earnings

Baseline Conclusions

- 7.28 The analysis of baseline socio-economic conditions indicates that the areas where the socio-economic effects of the proposed development are likely to be most pronounced are subject to social and economic challenges including above average levels of multiple deprivation, low qualifications levels, low representation of high value jobs, low incomes and, in the case of Portsmouth, high unemployment rates.

Identification and Assessment of Likely Effects

Construction Phase

Employment Impacts

- 7.29 The main socio-economic impact during the construction phase will be the additional temporary employment generated as a result of the construction of the scheme. Construction of Phase 1 is anticipated to begin in 2014 and finish in 2016 while construction of Phase 2 is anticipated to begin in 2020 and finish 2022. Therefore Phases 1 and 2 will have a combined construction period of four years.
- 7.30 Guidance from the Homes and Communities Agency (HCA) (Reference 7.3) and the Office of Project and Programme Advice and Training (OffPAT) (Reference 7.4) suggests that even if the construction jobs generated by a public sector financed development project last for more than a year they are unlikely to be the rationale for the project. They may however be recorded as a supplementary output particularly if they are likely to create work for the unemployed in high priority areas.
- 7.31 Construction employment for the Proposed Development has been estimated at approximately £81 million (over both phases). According to the Construction Skills Network, £1m in capital investment equates to 10.4 jobs on average. This equates to 844 construction jobs over the scheme's four year construction period.
- 7.32 In addition, further indirect jobs would be supported locally and regionally through supply linkage and income multiplier effects. This includes local firms supplying construction materials and equipment and construction workers spending part of their wages in the local economy. Assuming a composite multiplier of 1.29 at the local level and 1.44 at the regional level (Reference 7.5), the construction of the scheme could indirectly support a further 245 jobs locally and 371 jobs regionally.
- 7.33 In total, the Proposed Development could directly or indirectly support 1,088 temporary local jobs during the construction phases (1,215 at the regional level). In accordance with the HCA guidance, these employment effects may be important but should not be treated as key decision-making factors. They are recorded however and considered to have a temporary beneficial employment effect of moderate significance.

Social Impacts and Implications

- 7.34 In order for local people to take full advantage of the employment opportunities created by the construction of the scheme, they need to have the skills required to take up these jobs. The Annual Population Survey's Standard Occupational Classification indicates that Havant and Portsmouth have a higher than average proportion of people working in skilled trades occupations (11.3% compared to the regional average of 9.7%). This suggests that the local labour force is well prepared to take up the construction jobs that would be created by the scheme.
- 7.35 In order to further maximise the employment benefits of the construction phase, local skills and learning providers face the unique opportunity and the important challenge of working closely with the developers and local construction firms to ensure that more local people develop the necessary skills to work in the construction of the scheme. This could include training courses and apprenticeships aimed at developing local people's skills relevant to the construction industry.
- 7.36 An already strong construction labour pool in the local area and the further development of local people's relevant skills in combination with a recruitment policy that focuses on attracting local workers would ensure that a large portion of construction jobs would be taken up by local people. This would minimise the impacts on the provision of social services such as health and education and the need for new housing as the construction labour force would be made up primarily by local people already living in the area.
- 7.37 No details about the provision of catering and rest facilities are available at this stage but it is expected that some temporary facilities would be provided onsite with existing catering facilities in the area also benefiting from the additional expenditure generated by construction workers.
- 7.38 In terms of security and crime prevention, any possible criminal activities and anti-social behaviour at the site during the construction phase could be mitigated by the efficient guarding of the site. This would include both manned guarding and electronic surveillance through CCTV. The site's boundaries should be secured and access to the site controlled at all times. Valuable materials and plant should also be secured and the site should be well lit during the evening and night hours.

Operational Phase

Employment Impacts

- 7.39 The provision of new employment space will support the creation of a large number of new jobs. Phase 1 of the proposed scheme is expected to deliver 46,450 m² of employment (B1, B2, B8) floor space as well as a 5,574 m² hotel. Phase 2 could provide an additional 15,329 m² of new employment floorspace.
- 7.40 Employment floorspace is converted to number of full time equivalent (FTE) jobs in accordance with the HCA's Employment Densities Guide, 2nd Edition (2010). It is assumed that the Phase 1 split of employment floorspace will be 40% B1, 40% B2 and 20% B8 and that the hotel will be a 3 star hotel with 95 bedrooms. For Phase 2 it is assumed that the split of employment floorspace will be 50% B1 and 50% B2. The resulting employment figures are presented in Tables 7.4 and 7.5 below.

Table 7.4 - Phase 1 Job Creation

Use Class	Floorspace (bedrooms in the case of the hotel)	Employment Density (m ² per FTE employee/hotel bedrooms per FTE employee)	FTE Jobs
B1 (offices and light industry)	18,580 m ²	10 m ²	1,858
B2 (general industrial)	18,580 m ²	47 m ²	395
B8 (storage and distribution)	9,290 m ²	70 m ²	133
C1 (hotels)	95 bedrooms	2 bedrooms	190
Phase 1 total			2,576

Source: Atkins, HCA

Table 7.5 - Phase 2 Job Creation

Use Class	Floorspace	Employment Density (m ² per FTE employee)	FTE Jobs
B1 (offices and light industry)	7,665 m ²	10 m ²	766
B2 (general industrial)	7,665 m ²	47 m ²	163
Phase 2 total			930

Source: Atkins, HCA

- 7.41 Overall, the proposed scheme could create some 3,500 FTE jobs over the two phases of development. This would be a **permanent beneficial employment effect of large significance**.

Net Additionality

- 7.42 In appraising the effects of a development it is important to take into account those economic benefits that will be retained at a local or regional level and which will be brought about over and above what would take place anyway. The analysis below estimates the additional employment benefits that would be generated by the Proposed Development. To do so, the analysis uses the gross number of jobs estimated in the previous section and follows the HCA's additionality guidance (as set out in the Additionality Guide Third Edition, 2008) to estimate the net additional benefits at a local and regional level.
- 7.43 The key components of employment additionality are as follows:
- Deadweight (the number or proportion of outputs that would have happened anyway);
 - Leakage effects (the number or proportion of outputs that will benefit those outside of the intervention's target area);
 - Displacement (the number or proportion of outputs accounted for by reduced outputs elsewhere in the target area); and
 - Economic multiplier effects (further economic activity associated with additional local income, local supplier purchases and longer term development effects).

Deadweight

- 7.44 The first step in estimating the net additional jobs created is to account for deadweight, i.e. the amount of jobs that would have been created anyway, irrespective of the Proposed Development. It is assumed that deadweight for the proposed development will be around 25% of the total number of jobs created. This assumes that 25% of the proposed scheme's jobs would be created anyway as a result of a smaller-scale development of the site over the period to 2022.

Leakage

- 7.45 Leakage is estimated as the proportion of outputs that will benefit those outside the target area. Given the Site's good accessibility as a result of its proximity to the A3(M) it is assumed that leakage will be high at 50%. This means that 50% of created jobs will be taken up by people living outside the local area. Leakage at a regional level is expected to be zero however.

Displacement

- 7.46 Displacement would arise if businesses located in the Proposed Development were to employ people currently employed by firms elsewhere in the area. It follows that these would not be additional new jobs but would merely be displaced from elsewhere in the area. It is assumed that 25% of gross local direct jobs would be displaced from elsewhere in the local area. The displacement effect is assumed to be higher (50%) at a regional level as it is expected that many of the businesses that will be based at the site will move there from elsewhere in the region (rather than be new start-ups or businesses currently based outside the region).

Economic Multiplier Effects

- 7.47 Economic multiplier effects refer to supply linkage and income multipliers. In simple terms, they take account of the purchases made as a result of the development and further purchases associated with linked firms alongside the supply chain as well as local expenditure as a result of those who derive incomes from the direct and supply linkage impacts of the development. In accordance with the HCA Additionality Guide, the composite multipliers are assumed to be 1.29 at a local level and 1.44 at a regional level.
- 7.48 Based on the above assumptions, the net additional jobs created by the Proposed Development are expected to be 1,272 at the local level and 1,893 at the regional level.

Table 7.6 - Employment Additionality (local level)

	Proposed Development	Reference Case
Gross direct jobs	3,506	877
Estimated leakage (50%)	1,753	438
Gross local direct effects	1,753	438
Displacement (25%)	438	110
Net local direct effects	1,315	329
Multiplier (1.29)	381	95
Total net local effects	1,696	424
Total net additional local effects	1,272	

Source: Atkins, HCA

Table 7.7 - Employment Additionality (regional level)

	Proposed Development	Reference Case
Gross direct jobs	3,506	877
Estimated leakage (0%)	0	0
Gross regional direct effects	3,506	877
Displacement (50%)	1,753	438
Net regional direct effects	1,753	438
Multiplier (1.44)	771	193
Total net regional effects	2,524	631
Total net additional regional effects	1,893	

Source: Atkins, HCA

Economic Value of the Proposed Development

- 7.49 The net employment benefits generated by the Proposed Development can be converted into Gross Value Added (GVA) in order to estimate the economic value of the scheme at a local and regional level.
- 7.50 Productivity or GVA per worker was £34,800 in the Urban South Hampshire area in 2008 and £38,300 in the South East region (Reference 7.6). Applying these figures to the net additional jobs calculated in Tables 7.6 and 7.7 above, the Proposed Development has the potential of generating additional annual GVA of £44.3 million at the local level and £72.5 million at the regional level.
- 7.51 The above estimates confirm that the proposed development will have a **permanent beneficial effect of large significance** to the local and regional economies.

Contribution to Socio-economic Policy Objectives

- 7.52 The Proposed Development will contribute significantly towards the area's economic development and regeneration objectives. It will generate significant numbers of jobs during both the construction and operational phases and will provide high quality employment land to meet the needs of local businesses over the period to 2026.
- 7.53 The scheme will provide a significant opportunity for local skills and learning providers to develop the skills and qualifications of local people and address the existing skills gap. Furthermore, the major investment project will help the regeneration of a deprived area by lifting community and investor confidence in the area.
- 7.54 Based on the above, the Proposed Development will have a **permanent beneficial effect of moderate significance** towards achieving the area's socio-economic policy objectives.

Social Impacts and Implications

- 7.55 Similar to the construction phase, in order for local people to be able to take full advantage of the employment opportunities provided during the scheme's operational phase, they will need to possess the necessary qualifications and skills to be able to compete for these jobs. This is particularly the case for the scheme's 2,600 office based jobs which are likely to require higher levels of skills and qualifications.
- 7.56 As with the construction phase jobs, this provides an opportunity and a challenge for local skills and learning providers to work in partnership with local businesses to develop courses and training programmes that will reflect the skills needs of local employers. This will work out for the benefit of both local people who will find it easier to compete for the new jobs but also for employers who will find it easier to recruit locally.
- 7.57 In terms of the effects of the scheme on the local provision of housing and social services, they are likely to be minimal. This is because a significant part of the labour force working at the Site during its operational phase is expected to be locally based. A further part of the labour force is expected to commute to the Site from further away in the sub-region without having to relocate near the Site. It is likely that the scale of employment creation at the Site will attract some people to move into the area but these people will be well served by the significant housing-led mixed use developments planned in the area including the proposed developments at Old Park Farm (Waterlooville), Grainger Development Site (Waterlooville) and the former Procter and Gamble site (Dunsbury Way).
- 7.58 In fact, the Proposed Development can be considered a vital element for the sustainable development of the area given the scale of housing provision currently in the pipeline, particularly in Waterlooville which is in close proximity to the application site. Without the provision of a substantial number of local jobs, the provision of thousands of new dwellings could create an unsustainable imbalance between dwellings and jobs and encourage environmentally

unsustainable patterns of commuting. In that respect, the scheme is expected to have a **permanent beneficial sustainability effect of slight significance**.

- 7.59 In terms of security and crime prevention, it is widely recognised that people in full time employment are less likely to engage in crime and anti-social behaviour. In that respect, the scheme is expected to have a **permanent beneficial social effect of slight significance**.
- 7.60 Any concerns about crime and anti-social behaviour at the site during its operational phase can be mitigated to a large extent by considering crime prevention at the design, layout and construction stages of the development.

Cumulative Impacts

- 7.61 There are no socio-economic cumulative impacts to report.

Summary

- 7.62 The Proposed Development will generate major economic benefits in the form of temporary and permanent employment creation and increased economic value. During the construction phase, it will create some 844 direct construction jobs plus a further 245 indirect / induced jobs at the local level and 371 at the regional level. During the operational phase it will create 3,506 gross direct jobs, with 1,272 being net additional jobs at the local level and 1,893 at the regional level.
- 7.63 The Proposed Development will ensure that the supply of employment land meets local needs over the period to 2026, providing a high quality mix of business premises. The scheme will generate additional annual GVA of £44.3 million at the local level and £72.5 million at the regional level and provide a major boost to the local economy.
- 7.64 The creation of a wide range of office, industrial and warehouse jobs will provide local people, local skills and learning providers and local businesses with the opportunity to work in partnership to address the area's skills gap and enable local people to fully capture the benefits of the new jobs in their area.
- 7.65 In conclusion, the Proposed Development is expected to have an overwhelmingly positive socio-economic impact, contributing towards the economic development and regeneration objectives of the area.

Table 7.8 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Employment creation	Partnership working between local training and skills providers, construction firms and the developer will allow more local people to acquire the skills necessary to take advantage of the jobs created during the construction of the scheme.	Creation of 844 direct construction jobs plus a further 245 indirect / induced jobs at a local level and 371 at a regional level. These are temporary jobs during the four year construction period of phases 1 and 2. This is a temporary beneficial employment effect of moderate significance .
Operation		
Employment creation	Partnership working between local training and skills providers and local businesses will enable more local people to acquire the skills and qualifications necessary to take advantage of the jobs created during the	The proposed development will create 3,506 gross direct jobs over its two phases. This equates to 1,272 net additional jobs at the local level and 1,893 at the regional level. This is a permanent beneficial employment effect of large significance .

Description of Environmental Resource	Mitigation	Description of Residual Effect
	operational phase of the scheme.	
Economic value	N/A	The proposed development will generate additional annual GVA of £44.3 million at the local level and £72.5 million at the regional level. This is a permanent beneficial economic effect of large significance .
Security and crime prevention	Consideration of crime prevention at the design, layout and construction stages of the development.	An increase in the number of local people in full time employment is likely to lead to lower levels of crime and anti-social behaviour. This is a permanent beneficial social effect of slight significance .
Sustainable communities	N/A	The provision of large numbers of jobs in proximity to major planned housing developments will ensure the development of sustainable communities where people can live and work locally. This is a permanent beneficial sustainability effect of slight significance .
Contribution to socio-economic policy objectives	N/A	Contribution towards economic development and regeneration objectives as outlined in the Havant Core Strategy, Havant Employment Land Review, PUSH Economic Development Strategy, Regional Economic Strategy and PPS4. This is a permanent beneficial effect of moderate significance .

References

- 7.1 The site is located within Havant BC. However, Portsmouth is geographically close to the site and it is expected that many of the jobs created there will be taken up by Portsmouth residents, hence Portsmouth's inclusion in the core study area.
- 7.2 Winchester and East Hampshire have been excluded as they are large, mainly rural districts that stretch far away from the site.
- 7.3 English Partnerships Best Practice Note 15: Calculating Cost per Job, 2003.
- 7.4 OffPAT Tier 3 Technical Note, 2004.
- 7.5 English Partnerships Additionality Guide, Third Edition, 2008.
- 7.6 PUSH Economic Development Strategy, October 2010.

8 Transport & Accessibility

Introduction

- 8.1 This section provides an assessment of the likely significant transport effects of the Proposed Development and reviews the significance of these effects in the environmental context. It reviews the mitigation measures that may be required to support the Proposed Development.
- 8.2 A separate Transport Assessment (TA) has been carried out, which fully assesses the transport impact of the proposals to support the planning application. The method and results of the assessment are provided in this section.

Scoping Responses

- 8.3 Transport and accessibility issues raised by respondents to the EIA Scoping Report are summarised in Table 8.1.

Table 8.1 - Scoping Response - Transport & Accessibility Issues

Issue Raised	Respondent
There is no objection to the proposed approach to cover issues related to traffic and transport in the Transport Assessment provided this complied with all necessary planning legislation.	Mr S Jenkins, FAO Stephen Jenkins, Hampshire County Council, Highways Department (comment as at 29 March 2011 to the original Scoping Report).
The scope of the Transport Assessment will need to be agreed with the applicant at the appropriate time.	
It is advised that the developers engage early with the relevant authorities in relation to the Transport Assessment.	
In the event that the Transport Assessment identifies the need for any mitigation on the SRN and/ or if the increase in traffic resulting from the proposed development will result in breaching the statutory limits on the highway network, the HA would require an assessment of the environmental impacts as part of the EIA and the ES.	
Highway implications – A summary version of the TA to include key methods, data, findings, impacts and mitigation be included as a short chapter of the ES. Access & recreation - Reinstatement and creation of footpaths and bridleways should be considered and links to other green networks or urban fringe areas.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 November 2011 to the original Scoping Report).
Agricultural land use severance and changes in access should include consideration of any risks of crime to agricultural/ rural businesses and activities.	
Any proposal to incorporate measures to help encourage people to access the countryside for quiet enjoyment would be encouraged.	Simon Thompson, Natural England, Government Team (comment as at 15 March 2011 to the original Scoping Report).
Measures to reinstate and create footpaths and bridleways are to be encouraged.	
Links to other green networks or urban fringe areas should also be explored.	
An appropriately scoped traffic and transportation assessment and DMRB (Air Quality) assessment is proposed so no further	Jonathan Driver, Environmental Control Officer, Havant Borough Council (comment as 23 March

comments.	2011 to the original Scoping Report).
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Key Aspects of the Project

- 8.4 As noted in Chapter 3, Dunsbury Hill is a Strategic Site in the Havant Borough Core Strategy which was adopted on the 1st March 2011.
- 8.5 The Site remains key to delivering employment in the local and sub-regional areas and is seen as a potential new business gateway to South Hampshire via the A3(M) Corridor.
- 8.6 As noted in Chapter 4 the Proposed Development would be assigned a mix of approximately 40% B1, 40% B2 and 20% B8. The associated quantum of development is summarised in Table 8.2.

Table 8.2 - Dunsbury Hill Farm Land Use Breakdown

Land Use	Phase 1 m ² GFA	Phase 2 m ² GFA	Total m ² GFA
B1 (Business)	18,580	6,132	24,712
B2 (General Industrial)	18,580	6,132	24,712
B8 (Storage and Distribution)	9,290	3,065	12,356
C1 (Hotel)	5,574	-	5,574
Total	52,024	15,329	67,354

New Site Access

- 8.7 A new access will be provided via a link to the B2150 Hulbert Road as illustrated on Parameter Plan 1. The proposed site access arrangement includes a roundabout adjoining the B2150 Hulbert Road to the west. From this traffic can distribute north to the A3(M) Junction 3 and south to Purbrook Way. The roundabout is proposed to include single lane approaches on the south and east arms, flaring to two lanes on the approach (approximately 20m before the give way lines). The north arm would include a single straight ahead lane and a dedicated left turn to the Site approximately 80m north of the give way lines.
- 8.8 Parameter Plan 1 also identifies the provision of a link road from the new access through the Site to the east into Leigh Park joining the existing Woolston Road three arm roundabout. The Woolston Road access will operate as a bus only link enforced via a bus gate and will also serve to provide a second point of access in emergencies.
- 8.9 The access and link road design is shown in the Figure 4.5.

Public Transport Proposal

- 8.10 There are plans for a Havant Cross Borough Bus Service connecting Waterlooville to the west and Leigh Park to the east of the A3(M) corridor. It is envisaged that this bus route will use the Hulbert Road access and the Woolston Road bus-only link and cross the Site. This will substantially reduce the journey time between Leigh Park and Waterlooville. The proposed route for this service through the Site is illustrated in Figure 8.1.
- 8.11 Portsmouth City Council is committed to the Cross Borough Bus Service being delivered as part of the development at Dunsbury Hill Farm. Discussions have been held with HCC, TfSH and local bus companies to ensure a linkage to the wider BRT network.
- 8.12 In addition these access points will enable the existing local bus routes to enter and leave the Site from either the east or west of the A3(M) without needing to travel through the Site. New bus infrastructure on the link road in the form of a bus turn round or bus interchange will ensure that the site can be served by the Cross Borough Service and the existing local bus services. The

Proposed Development thus provides the opportunity for a direct link to connect the existing bus routes 39 and 23 into and potentially to the west of the Site.

- 8.13 It is proposed that a bus gate is placed at the far east of the proposed Farm link road, so that the site is permeable to buses, and an appropriate place for interchange introduced either east or west of the Link Road.
- 8.14 This is considered to be the appropriate transport infrastructure to enable future development on the Site in accordance with the agreed land uses.

Walking and Cycling Proposals

- 8.15 The main pedestrian access route to the Site will be from the east side where the bus gate connects to Woolston Road in Leigh Park. The main cycle access will also be from this location as well as to the west via the existing bridleway which crosses the A3(M).
- 8.16 Access for pedestrians and cyclists from the west via Hulbert Road leading across the A3(M) Junction 3 to Waterloo and south on Hulbert Road to the ASDA roundabout has been considered by Atkins as requested by Hampshire County Council. The assessment showed that these routes are not advisable based on safety and cost issues balanced against expected demand.
- 8.17 The existing bridleway which crosses the Site will be maintained. Park Lane is a well used bridleway which would be upgraded as part of a site wide approach to footpaths and cycle ways; this would also extend connections to Havant Thicket Reservoir.
- 8.18 To the north of the link road it is proposed to implement a 3 metre wide shared footway / cycleway. To the south of the proposed link road it is proposed to implement a 2 metre wide footway. Crossing points for pedestrians and cyclists across the carriageway are proposed at the accesses to the development plots to the south and at either end of the proposed bus stops. A crossing point has been proposed across the link road between the easternmost plot access and the Woolston Road roundabout. This aligns with the existing footpath that links into the Park Lane bridleway.
- 8.19 The design of secondary routes and local access to the development plots will be developed in the detailed design. These will include footways on the site roads with street lighting. Suggested access routes are shown on the Indicative Masterplan.
- 8.20 Future opportunity exists to make the connection with Staunton Country Park, whilst enhancing existing accessibility across the Site for all modes and prioritising pedestrians and cyclists.

Relevant Legislation, Policies and Guidelines

- 8.21 The relevant national, regional and local transport planning policy has been reviewed in the context of the proposed development. This is covered thoroughly in the Transport Assessment. A summary is provided here.

National Level Policy

Planning Policy Guidance 13 'Transport' (2011)

- 8.22 This policy has been summarised in Chapter 3. By influencing the location, scale and type of development it is possible to reduce the need to travel, reduce the length of journeys and increase the use of public transport, walking and cycling. Application of the policies set out in PPG13 should enable people to make more sustainable transport choices, reduce congestion and improve air quality.

Transport White Paper 'Future for Transport' (2004)

- 8.23 The paper aims to create a transport network that can meet the challenges of a growing economy and the increasing need for travel while also working towards the government's overriding

environmental targets. The focus of the paper is to develop a coherent transport network with an efficient free-flowing road network, bus services that are reliable, flexible, convenient and tailored to local needs and walking and cycling as a real alternative for local trips.

Delivering a Sustainable Transport System (2008)

- 8.24 Towards a Sustainable Transport System' (TaSTS) has been followed by the publication of 'Delivering a Sustainable Transport System' (DaSTS) in November 2008. DaSTS is shaping the future approach to transport in the Department for Transport (DfT), with a new series of goals developed that will profoundly shape future strategy beyond 2014 based around tackling climate change, supporting national growth, promoting greater equality of opportunity, contributing to better safety, security and health and improving quality of life.
- 8.25 DaSTS recognises that there are multiple challenges for transport, not only in terms of climate change and productivity and competitiveness, but also in terms of helping to tackle deep-seated deprivation, addressing poor health outcomes amongst many communities, improving transport safety and security, and protecting natural and urban environments.

Local Transport Act (2008)

- 8.26 The Local Transport Act, which received royal assent in November 2008, proposes a number of reforms that will give local authorities increased powers to drive forward transport improvements in their areas. This includes reforms to bus regulation, improved service delivery and new transport governance arrangements, with the potential to create new Integrated Transport Authorities (ITAs), and a range of tools to develop working arrangements to reflect the needs of city regions and localities.

Regional Level Policy

From Crisis to Cutting Edge: Regional Transport Strategy (2002)

- 8.27 From Crisis to Cutting Edge, the Regional Transport Strategy (RTS) for the South East of England identifies the strategic transport policy for the region up to 2016 and beyond. This describes policies in relation to public transport, management and maintenance of the road network, gateways into the region, freight, parking, walking, cycling and priorities for regional investment.
- 8.28 With regards to South Hampshire, the Regional Transport Strategy earmarks the sub-region as an investment priority. The RTS identifies significant potential for economic growth in the region but highlights mismatch between affordable housing in city centre and decentralised employment. The RTS highlights the ports of Southampton and Portsmouth as valuable gateways in the region to the rest of the UK. The biggest problem across the region is the over-reliance on road based transport for both travel and freight, compounded by a lack of investment in the highway network and public transport.

PUSH South Hampshire Sub-Regional Strategy (2005)

- 8.29 The goal for South Hampshire is to improve its economic performance to at least match the regional average. The target is an increase in Gross Value Added (GVA) of between 3.0 and 3.5 per cent per annum. To support this projected GVA growth rate the following transport related targets were suggested:
- Improve strategic accessibility in general;
 - Address bottlenecks;
 - Invest in public transport;
 - Improve links to London and Heathrow; and
 - Increase capacity of Southampton Airport.
- 8.30 Since there is insufficient scope within urban areas and current allocations to meet the long term needs of South Hampshire, further Greenfield housing development is required. PUSH's preferred

approach is to concentrate on large proposals, termed 'Strategic Development Areas' (SDAs). These would be model sustainable communities, and would comprise a full range of services and facilities, as well as housing and employment opportunities. PUSH concluded that only two SDAs are required for South Hampshire to help deliver the required number of new homes between 2016 and 2026. Each SDA needs to be of a sufficient size and located within close proximity of one of the two cities, with scope to establish good public transport links to them. The two areas identified for SDAs are to the north and north east of Hedge End (around 6,000 new homes) and to the north of Fareham (around 10,000 new homes).

Regional Network Report for the South East (2008)

- 8.31 The Highways Agency's (HA) annual Regional Network Report (RNR) provides a regional outlook of the Strategic Road Network (SRN) within the South East of England.
- 8.32 Data provided by the report shows the condition of the SRN with regard to travel patterns, vehicle flows, environmental issues, and vehicle delay. At a sub-regional level, South Hampshire and routes leading into the sub-region suffer from some of the slowest and least efficient parts of the SRN nationally. The A3, A27, M3 and M27 are all listed as suffering from consistent daily delays, congestion, and stress through operating over capacity. At the local level, this includes the M27 between Portsmouth and Southampton, the A3 between London and Portsmouth, and the A27 to Hastings. By 2026, the entire M3, M27 and A27 between Portsmouth and Chichester are expected to experience prolonged delays and congestion throughout the day extending beyond the AM and PM peak hours.
- 8.33 Development at Dunsbury Hill Farm would add additional trips onto the A3(M) at Junction 3 and 4 in particular. However the modelling and assessment of these has been used to show this would not have a detrimental impact on capacity here. The development of the site would however allow the realisation of the Cross Borough Bus Route which is a long term strategy for the region.

Local Level Policy

Hampshire Local Transport Plan 3 (2011 - 31)

- 8.34 The main objectives of LTP3 are structured around the following themes:
- Supporting the economy through resilient highways;
 - Management of traffic;
 - The role of public transport;
 - Quality of life and place; and
 - Transport and growth areas.
- 8.35 The core philosophy of the LTP is that transport problems should be addressed using the principles of:
- **Reduce:** Wherever practicable and relevant, to reduce journey lengths and the need to travel;
 - **Manage:** Where journeys cannot be avoided, to make the best use of existing infrastructure across all modes and introduce measures to influence travel choices; and
 - **Invest:** If unavoidable travel demand cannot be met by the existing infrastructure then to provide additional infrastructure.

Solent Transport Sub-Regional Strategy (STSS) (2006 - 11)

- 8.36 The STSS sets out the broad strategy within which Hampshire County Council, Portsmouth City Council and Southampton City Council aim to manage the transportation challenges and opportunities that the South Hampshire Sub-Region will face over the next 20 years.

8.37 The Strategy incorporates the four shared priorities of the three authority's set out in LTP2; these shared priorities are:

- Accessibility;
- Congestion;
- Road Safety; and
- Air Quality.

Transport for South Hampshire - Towards Delivery (2008)

8.38 The TfSH statement 'Towards Delivery' sets out the issues and priorities for the area in the context of planned growth. The strategy follows the Reduce – Manage – Invest philosophy of the LTP3. The 'Reduce' element of the strategy includes initiatives to reduce the need to travel via planning policies, careful design of development sites, significant public transport improvements and supporting sustainable modes of walking and cycling as well as managing car parking.

Havant Borough Council Core Strategy (Adopted 2011)

8.39 The Core Strategy vision is to work towards a 'cleaner, safer and more prosperous borough' and aligns with the Sustainable Community Strategy. The Core Strategy is discussed in Section 3, which presents the relevant transport policies.

8.40 In terms of planning for more sustainable travel, the development with provision of bus infrastructure on site, allows for the safeguarding of the Bus Rapid Transit System and therefore is consistent with these policies in promoting access to the site by public transport.

Parking Standards

8.41 The Havant Borough Council (HBC) and Hampshire County Council (HCC) parking standards for employment and hotel land uses are shown in Table 8.3 below.

Table 8.3 - HBC Parking Standards

Land Use	Car Parking Standard Maximum Limit	Cycle Parking Standard (minimum)	
		Long Stay	Short Stay
B1 Office	1 space per 30 sqm	1 stand per 150 sqm	1 stand per 500 sqm
B2 General Industrial	1 space per 45 sqm	1 stand per 350 sqm	1 stand per 500 sqm
B8 Warehousing	1 space per 90 sqm	1 stand per 500 sqm	1 stand per 1000 sqm
C1 Hotel	1 space per bedroom	1 space per 6 staff or 1 space per 40 sqm	1 stand per 10 bedrooms

8.42 Within the Proposed Development the principle will be adopted that the proposed levels of parking provision will be in accordance with relevant HBC standards for employment land uses and hotel developments. Where possible the strategy will, commensurate with the public transport strategy, seek to reduce provision to strengthen the sustainability credential of the Site. This can be implemented via a car park management plan as a core component of the Workplace Framework Travel Plan.

Approach to Assessment

8.43 This assessment is based on the approach presented in a transport scoping report and agreed with HBC, HCC and the Highways Agency (HA). The study area for the purpose of this assessment was agreed at the scoping stage and includes the A3(M) Junctions 3 and 4, the Hulbert Road/Purbrook Way ASDA roundabout and the links in between including B2150 Hulbert Road past the Site.

- 8.44 The highway impact has been assessed using Transport for South Hampshire's (TfSH) Sub-Regional Transport Model (SRTM) developed by MVA Consultancy that provides the evidence base for the South Hampshire transport strategy development process, and a VISSIM micro-simulation model.
- 8.45 The base VISSIM model was developed by Atkins using existing traffic count data collected in May 2011 to support this application. The calibrated and validated base models have been used to evaluate the impact of the Proposed Development in the forecast years. The traffic demand from the SRTM has been used in the VISSIM model for the future year assessments.
- 8.46 The SRTM is a model suite that was developed to forecast travel demand overtime to 2036 in response to forecast transport improvements and interventions, and changes in land-use and general economic conditions. The model suite consists of a road traffic model (RTM), a public transport model (PTM), and a demand model (MDM). Further, a local economic impact model (LEIM) considers changes in population, employment, accessibility and development.
- 8.47 It is considered, and agreed with the stakeholders, that this model provides the best basis for analysis of the impact of the Proposed Development. The model is based on Core Strategy quantum of development at Dunsbury Hill Farm which is consistent with Parameter Plan 2. Given the level of information available without firm fixes of building locations, it is considered appropriate that the assessment focuses on the traffic impact of the Proposed Development using the South Hants SRTM.
- 8.48 The model has been reviewed to ensure that the land use allocation is correct, and in addition, that the public transport strategy including the Cross Borough Bus Service is captured and appropriately modelled.
- 8.49 The SRTM has a base year of 2010 and forecast years of 2014, 2019, 2026 and 2036. For the Proposed Development the model was projected to 2026 only.

Forecast Year of Assessment

- 8.50 Of the SRTM horizon years, 2014 proceeds the commencements of the Masterplan and 2019 and 2026 are broadly aligned to completion and subsequent full occupancy of Phase 1 and Phase 2 therefore have formed the basis of future year assessment of the development in SRTM and then in the VISSIM model.

Committed and Proposed Developments

- 8.51 The SRTM captures all committed and proposed developments required for this assessment. The key developments in the area are:
- West of Waterlooville Major Development Area;
 - Hampshire Farm, Emsworth;
 - Land south of Scratchface Lane, adjacent to A3M, Havant; and
 - Woodcroft Farm in the Wecock Farm area - Strategic Site outlined in the Core Strategy.

Trip Generation and Distribution

- 8.52 The trip generation for the Dunsbury Hill Farm development in SRTM has been compared to a trip generation estimate using the TRICS database. This has shown that the trips in SRTM are lower than Atkins' trip generation estimation using TRICS, which can be due to a number of reasons including the fact that the TRICS estimate is based on the 'business park' category, which includes more B1 (business use) than the Proposed Development. The SRTM forecasts have been used in the assessment of the Proposed Development as the SRTM has considered detailed planning and employment growth assumptions which form the evidence base for the South Hampshire transport strategy development process. However a sensitivity test has been carried out to understand the impact of the higher TRICS trip rates as a worst case.

- 8.53 The final peak hour vehicular trip generation within SRTM is presented in Table 8.4. This includes all employment land uses on site as well as the hotel and has incorporated staff as well as servicing, deliveries etc.

Table 8.4 - Dunsbury Hill Farm - Trip Generation based on SRTM

Phase	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Phase 1	356	60	126	393
Phase 2	58	13	12	90
Total	414	73	138	483

- 8.54 The approximate forecast mode share of the development trips based on SRTM predictions is as follows:
- Car - 75%;
 - Public Transport - 2%; and
 - Walking and Cycling - 23%.
- 8.55 The distribution of trips in the SRTM from zone to zone is based on the levels of population and employment and relative attraction of the zones. The assignment of trips in the SRTM is based on the SATURN model assignment which includes the calculated cost and delays of various routes following iterations of the model.

Receptors and Significance Criteria

- 8.56 The impacts of development will be considered for the following:
- Highway network;
 - Public Transport; and
 - Walking and cycling.
- 8.57 In assessing the significance of the impact, the following receptors have been considered:
- Vehicle, pedestrian and cyclist delay;
 - Pedestrian and cycling amenity;
 - Accessibility; and
 - Road safety.
- 8.58 The impacts on other environmental and human receptors (air quality, ecology, watercourses, properties and landscape) resulting from traffic increases are considered in other sections.
- 8.59 The significance criteria used to assess the effects of the Proposed Development are derived from a qualitative assessment of the sensitivity of the receptor and the magnitude of the impact as defined in Chapter 2.

Baseline Conditions

- 8.60 This section reviews the location of the Site in terms of existing transport provision, including an analysis of existing traffic conditions around the Site and analysis of accident data.
- 8.61 As discussed in Section 3 the Site currently comprises predominantly agricultural land that lies within an undeveloped strategic gap immediately east of the A3 (M) motorway Junction 3, between Waterlooville and the northern area of Havant. The slip road leading off the A3(M) is the B2150

known as Hulbert Road which leads southwards to Purbrook Way. It is intended that this road will be adjoined by the link road to provide access to the Site.

- 8.62 As the existing Site is predominantly comprised of agricultural land, there are currently no vehicle trips generated by the Site.

Local Area

- 8.63 The land to the west, east and further south of the Site is predominantly characterised by residential land use. This includes Waterloooville to the west, the Leigh Park estate to the east and Havant further south. There are a number of educational establishments in the wider area including South Downs College, which is off Purbrook Way to the west of the A3(M). There is retail land use located to the south of the Site, including an ASDA store and B&Q store off Purbrook Way. Havant town centre is located approximately 3km south east of the Site.

Leigh Park

- 8.64 Leigh Park is a residential estate that lies to the east of the proposed development. It is a 20 mph zone. The roads in the estate are generally single carriageway with one lane in each direction, with street lighting and footways on both sides of the carriageway. There are parking restrictions around the road junctions and some parking lay-bys and driveways; otherwise, parking is not restricted.
- 8.65 There is a mini roundabout at the junction of Middle Park Way and Woolston Road. There is a roundabout at the junction of Woolston Road and Calshot Road, which also provides access to Bellway Homes and a fourth arm, which is provided to allow for the future bus access to Dunsbury Hill Farm.

B2150 Hulbert Road

- 8.66 The B2150 Hulbert Road links the A3 London Road in Waterloooville to the B2149 Bedhampton Road, in Bedhampton, adjacent to Havant. Adjacent to the Site, the B2150 Hulbert Road is a single carriageway road with one lane in each direction and a derestricted speed limit. The speed limit is derestricted through the A3 (M) Junction 3 roundabout and reduces to 30 mph north of the B2150/Purbrook Way roundabout. The carriageway width on this section is 3.2 metres in both directions. There are no footways or cycle routes along the B2150 Hulbert Road.
- 8.67 The section of Hulbert Road between the A3(M) Junction 3 and west to the Tempest Avenue / Frenstaple Road roundabout is dual carriageway with a derestricted speed limit.

B2150 Hulbert Road / Purbrook Way / Asda roundabout

- 8.68 To the south of the Site, the B2150 Hulbert Road intersects with Purbrook Way at a five arm roundabout, comprised of the following arms:
- B2150 Hulbert Road north;
 - B2150 Hulbert Road south;
 - Purbrook Way west;
 - Purbrook Way east; and
 - The Asda access road.
- 8.69 The roundabout has two circulatory lanes. The B2150 Hulbert Road south, Purbrook Way east and west arms all have two lanes on approach to the roundabout junction. Although not marked as such the Asda access also has two lanes on approach to the roundabout. The roundabout currently experiences congestion and has been identified as a bus congestion location. Queues have been observed at this roundabout reaching 9 and 7 vehicles in the nearside /offside lanes on Hulbert Road North; 9 and 3 vehicles on Purbrook Way East; 7 in each lane on the ASDA exit and 9 and 3 vehicles in the nearside/offside lanes of Purbrook Way West (all PM Peak). These queues demonstrate the existing delay at the roundabout.

Purbrook Way

- 8.70 Purbrook Way on the section between the A3(M) Junction 4 and the Hulbert Road / Asda roundabout is one wide lane in each direction, other than the approaches to the junctions, which are two lanes. The speed limit changes half way along and is 30 mph nearer to Hulbert Road and 40 mph nearer to the A3(M). There is street lighting and pavement on the north side and a short section on the south side close to the Hulbert Road roundabout. This southern section of footway connects to a signalled pedestrian crossing of Purbrook Way close to the pedestrian access to the B&Q store.
- 8.71 The section of Purbrook Way east of the Hulbert Road / ASDA roundabout has one lane in each direction with many right turn ghost islands and pedestrian refuges as well as parking bays. There is street lighting and footways on both sides of the road. The speed limit is 30 mph.
- 8.72 The section of Purbrook Way west of A3(M) Junction 4 has one wide lane in each direction, with a section of two lanes on the eastbound approach to the A3(M) junction (for approximately 200m). The speed limit is 40 mph, changing to 30 mph further west towards Waterlooville. There is street lighting and footways on both sides of the road to the west of College Road, and on the north side only east of College Road, which is shared with cyclists.

Strategic Highway Network

A3 (M) Junction 3 Roundabout

- 8.73 The A3 (M) Junction 3 roundabout is effectively a four arm un-signalised roundabout, with an additional two exit only arms as follows:
- B2150 Hulbert Road West;
 - B2150 Hulbert Road East;
 - A3 (M) Southbound off-slip;
 - A3 (M) Northbound off-slip;
 - A3 (M) Southbound on-slip (exit only); and
 - A3 (M) Northbound on-slip (exit only).
- 8.74 The B2150 Hulbert Road to the west of the junction is dual carriageway with two lanes entering and two lanes exiting the roundabout. To the east of the junction it is a single carriageway road with one lane in each direction, widening to two lanes at the entry point to the roundabout junction.
- 8.75 The A3 (M) on and off slips all have two lane entries to and exits from the roundabout junction. The roundabout has two circulatory lanes.

A3(M) Junction 4

- 8.76 The A3 (M) Junction 4 consists of two small roundabouts either side of the A3 (M). The western roundabout has the following arms:
- A3 (M) Northbound off-slip;
 - Purbrook Way West; and
 - Purbrook Way East.
- 8.77 The eastern roundabout consists of the following arms:
- Purbrook Way West;
 - Purbrook Way East;
 - B&Q Access; and
 - A3 (M) Southbound on-slip (exit only).

- 8.78 All approaches have two lanes except for the B&Q access, which is one lane in and one lane out. All exits at this junction have two lanes except Purbrook Way eastbound exit which is one lane. Purbrook Way west merges to one lane 50 m west of the junction.

Public Transport

Buses

- 8.79 The nearest bus services are Route 23 at Calshot Road (Larkwhistle Walk), approximately 400m from the Site, and Route 39 at Middle Park Way (Woolston Road), approximately 500m from the Site. Route 37 runs west of the site in Waterlooovile. A summary of these and other nearby services is shown in Table 8.5 below. These services are operated by Stagecoach. The bus station in Havant town centre has recently been redeveloped and provides a good interchange facility between bus services, as well as bus to rail journeys, being located only 300m from Havant rail station.

Table 8.5 - Existing Bus Services near Dunsbury Hill Farm

Route Number	Nearest Stop	Origin	Destination	AM Peak Hour Frequency
23	Calshot Road (Larkwhistle Walk)	Southsea	Leigh Park	10 minutes
39	Middle Park Way (Woolston Road)	Havant	Wecock Farm	15 minutes
37	Hulbert Road Roundabout, Waterlooovile	Havant	Alton	30 - 60 minutes
20	Dunsbury Way (Leigh Park)	Havant	Portsmouth Harbour	30 minutes
21	Dunsbury Way (Leigh Park)	Havant	Portsmouth Harbour	20 - 30 minutes

Rail Services

The nearest railway station is Bedhampton, which is just over 2km from the site, although Havant Station (just over 2.5km from the site) on the main London to Portsmouth line offers more services. Both stations are within approximately 15 minutes cycling distance from the site. Rail services at Havant are operated by First Great Western, Southern and Southwest Trains. A summary of the services at Havant and Bedhampton stations are shown in Table 8.6 and

- 8.80 below.

Table 8.6 - Existing Rail Services at Havant Station

Train Operating Company	Origins	Destinations	AM Peak Hour Frequency
First Great Western	Bristol Temple Meads	Brighton	N/A (limited daytime service)
Southern	Barnham Brighton Ford Littlehampton London Victoria	Portsmouth & Southsea Portsmouth Harbour Southampton Central	5 trains / hour
Southwest Trains	Guildford London Waterloo	Havant Hilsea	3 trains / hour

Train Operating Company	Origins	Destinations	AM Peak Hour Frequency
		Portsmouth & Southsea Portsmouth Harbour	

Table 8.7 - Existing Rail Services at Bedhampton Station

Train Operating Company	Origins	Destinations	AM Peak Hour Frequency
Southern	Barnham Brighton Ford Littlehampton London Victoria	Portsmouth & Southsea Portsmouth Harbour Southampton Central	4 trains / hour
Southwest Trains	Guildford London Waterloo	Havant Hilsea Portsmouth & Southsea Portsmouth Harbour	2 trains / hour

- 8.81 Figure 8.2 shows the public transport links within the vicinity of the site, and includes the bus stops that are within close proximity to the site.

Walking and Cycling

- 8.82 There is an existing bridleway passing through the Site along Park Lane, which forms a cycle route linking Tempest Avenue, to the west of the A3 (M), to Middle Park Way and Dunsbury Way to the east of the A3 (M); this crosses the A3 (M) on a bridge to the north of Junction 3. There is an off-road cycle route southbound from Woolston Road roundabout along Middle Park Way. The route continues off-road along the Hermitage Stream path which heads south towards Havant town centre. There is also an off-road cycle route along Purbrook Way west of the Hulbert Road / ASDA Roundabout which heads to the west of the A3(M). All these routes are connected to the residential areas and Havant town centre, with a network of suggested link routes, some of which are signposted at present.
- 8.83 There is a circular footpath adjacent to the Site between Park House Farm Way and Ramsdale Avenue and between Ramsdale Avenue and Park Lane, which connects with the Park Lane bridleway. An east-west bridleway connects with Park Lane leading from the north of the Site eastwards to Stansted and Rowland's Castle. From this there is a bridleway leading south to Swanmore Road and Dunsbury Way.
- 8.84 The walking and cycling routes are shown in Figure 8.3. These were sourced from the Havant Borough Council Cycle Map 2011.

Accident Analysis

- 8.85 Accident data has been obtained from HCC for the last five years from June 2006 to May 2011 for the Study Area, as covered by the VISSIM model. A summary of the accidents recorded at each junction, or section of road, is shown in Table 8.8 below.

Table 8.8 - Summary of Accidents Recorded in Study Area from 2006 to 2011

Location	Total No. of Accidents			Involve Ped	Involve Pedal Cyclist
	Slight	Serious	Fatal		
Hulbert Road (100m west of	2	0	0	1	0

Location	Total No. of Accidents			Involve Ped	Involve Pedal Cyclist
	Slight	Serious	Fatal		
Frendstaple Road Roundabout)					
Hulbert Road / Tempest Avenue / Frendstaple Road Roundabout	13	0	0	0	3
Hulbert Road (between Tempest Avenue Roundabout and A3(M))	2	2	0	0	0
A3(M) J3 Roundabout with Hulbert Road including slip roads	33	0	0	0	0
A3(M) North of J3	3	1	0	0	0
A3(M) between J3 and J4	5	0	0	0	0
A3(M) south of J4	3	0	0	0	0
Hulbert Road (between A3(M) J3 and Purbrook Way Roundabout)	4	0	0	0	0
Hulbert Road / Purbrook Way / ASDA Roundabout	9	0	0	1	1
Purbrook Way (between A3(M) and ASDA Roundabout)	3	2	0	3	1
A3(M) J4 Eastern Roundabout and B&Q Entrance	4	1	0	1	1
A3(M) J4 Western Roundabout	4	2	0	0	0
Purbrook Way (100m west of A3(M))	1	0	0	0	0

- 8.86 There have been a total of 8 serious accidents in the Study Area and 86 accidents of slight severity. The majority of accidents occurred at the A3(M) Junction 3 with Hulbert Road, including the slip roads, as well as the Hulbert Road / Tempest Avenue Roundabout.
- 8.87 These accidents have been compared against national average accident statistics established from the Road Casualties Great Britain Annual Report 2009 (Table 19 – Road Accident by Junction Type). Based on this, the national average proportions of accidents by severity and junction type are shown in Table 8.9.

Table 8.9 - National Average Road Accidents by Junction Type

Junction Type	Percentage of Accident by Severity		
	Slight	Serious	Fatal
Motorway Roundabout	96%	4%	0%
Built up roads Roundabout	92%	8%	0%

- 8.88 The majority of accidents that have occurred at the roundabout junctions in the study area are rear end vehicle shunts and are caused by driver behaviour and occasionally worsened by poor weather conditions. The majority of accidents recorded on the sections of road between junctions in the study area are caused by driver behaviour, again worsened by weather conditions and occasionally the geometry of the road. Where there are pedestrians wanting to cross the road (Purbrook Way near B&Q pedestrian access), these contribute to the volume of accidents. However, there has been a signalled pedestrian crossing added recently at this location on Purbrook Way, which should reduce the incidence of these accidents. (Please see TA for more detail).

Traffic Data

- 8.89 Atkins commissioned Manual Classified Counts (MCC), queue lengths and journey time surveys on Tuesday 24th May 2011 together with Automatic Traffic Counts (ATC) between 19th and 26th May 2011 for the base VISSIM model. The surveys took place at the following junctions:
- B2150 Hulbert Road/A3(M) Junction 3;
 - Purbrook Way/B2150 Hulbert Road Roundabout; and
 - Purbrook Way / A3(M) Junction 4.
- 8.90 The ATC surveys were undertaken at the following locations:
- B2150 Hulbert Road between A3(M) Junction 3 and Purbrook Way/B2150 Hulbert Road Roundabout;
 - Purbrook Way between A3(M) Junction 4 and Purbrook Way/B2150 Hulbert Road Roundabout;
 - Purbrook Way between College Road and A3(M) Junction 4 Northbound off-slip;
 - B2150 Hulbert Road between Tempest Avenue and A3(M) Junction 3;
 - Purbrook Way east of Park House Farm Way; and
 - Hulbert Road south of Willowdene Close.
- 8.91 Journey time surveys have also been carried out to aid with the validation of the VISSIM model for two routes covering the extent of the model.
- 8.92 The MCC traffic data has been collected for the AM (0700-1000 hours) and PM (1600-1900 hours) peak periods on Tuesday 24th May 2011. From this data, the network peak hours have been identified as:
- AM Peak Hour: 0745-0845 hours; and
 - PM Peak Hour: 1645-1745 hours.
- 8.93 Using the ATC data it has been identified that, on average, there is a two-way traffic flow of 1,336 and 1,460 vehicles on the B2150 Hulbert Road during morning and evening peak hours (0800-0900 hours and 1700-1800 hours) respectively. This equates to around 890 vehicles per hour in the busiest one-way direction from the A3 (M) Junction 3. The TA identifies the existing 2011 flows on other roads in the Study Area, including the A3(M) for which data was obtained from the Highways Agency TRADS database.

Sub-Regional Transport Model Base Traffic Flows

- 8.94 The collected traffic flows from May 2011 have been used in the base VISSIM model. Whilst the Sub-Regional Transport Model (SRTM) forecast flows have been used in the VISSIM forecasting assessment, it was agreed that the base VISSIM model would be based on the data collected in May 2011 to support this application rather than the SRTM 2010 base year data. This is due to it being the most recent data available, as well as concerns with the SRTM base data as outlined below.
- 8.95 The traffic counts informing the SRTM are relatively current with surveys having been conducted in 2009 and these included roadside interviews, manual classified counts (MCCs), Automatic Traffic Counts (ATCs), junction turning counts, Automatic Number Plate Recognition (ANPR), saturation flow surveys and journey time surveys.
- 8.96 The data collected in May 2011 by Atkins has been used to review and validate those modelled in the SRTM 2010 base year.

- 8.97 As a result of this review, it was found that there were some significant discrepancies between the SRTM flows and Atkins' May 2011 data. These flow discrepancies were worse as a result of the Study Area falling between two cordons in the SRTM. It was only due to the local level assessment required, that these were considered to be a concern. The traffic counts undertaken in May 2011 were consequently fed back into the SRTM model to calibrate the model performance in this area of the network. This method of approach was agreed to enhance the base 2010 modelled representation of conditions for the Site, and hence the future forecasting flows.

Base VISSIM Micro-Simulation Model

- 8.98 The base VISSIM model has been developed as the key indicator of traffic impact of the proposals covering the key junctions in the area, including the A3(M) Junction and 3 and 4 and B2150 Hulbert Road / Purbrook Road (un-signalised roundabouts).
- 8.99 The development of the model was undertaken in accordance with the HA's document 'Guidelines for the Use of Micro Simulation Software' (July 2007) (Reference 8.1). The model is based on the traffic counts carried out in May 2011 as outlined in the Traffic Data section above.

Identification and Assessment of Likely Significant Effects

Construction Phase

- 8.100 At this stage there is no detail on the construction activities, the plant and machinery required and hence no detail on the predicted number of construction vehicle movements. The approximate construction timescales are known which include 12 months for the construction of the proposed access and link road and a combined construction period of four years for Phase 1 and 2. It is anticipated that approximately 844 construction jobs would be created for the Site.
- 8.101 The traffic movements could include:
- Site staff vehicles;
 - Vehicles delivering materials, equipment and apparatus; and
 - Potential for vehicles bringing large abnormal sized loads.
- 8.102 It is now known at this stage whether there would be any abnormal loads to accommodate.
- 8.103 It is proposed that HGVs would access the site via A3(M) Junction 3 to provide a direct route to the Strategic Road Network (SRN). Construction workers would access the site via all roads. With this in mind, the impact on vulnerable receptors is expected to be minor.
- 8.104 There may also be some diversion of vehicles travelling along the roads in the local area at the time of constructing the access junction but this is expected to be a **temporary minor effect**.
- 8.105 A Construction Environmental Management Plan would be developed as the scheme progresses and produced by the contractors. This would assist in the implementation of environmental management mitigation and controls to reduce any negative impact from the construction traffic. Typical measures could include:
- Specific routes defined to the site (this includes all HGV traffic arriving via A3(M) Junction 3;
 - Restrictions to the movement of HGVs to particular times of the day to reduce the impact on vulnerable users, for example school children;
 - Ensure the HGV movements are also spread through the day (whilst avoiding sensitive times) to avoid a large volume arriving or departing together; and
 - Pedestrian warning signing of increased HGV movements.

- 8.106 It is also recommended that where possible the impact is considered in the design and use of materials so that this can be done with the minimum amount of traffic generation, in particular reducing the need for larger vehicles and abnormal loads.

Operational Phase / Operational Effects of the Scheme

Sub-Regional Transport Model (SRTM)

- 8.107 The results from the SRTM are covered in MVA's report 'Transport for South Hampshire Evidence Base: Dunsbury Hill Farm Report' dated August 2011 (Reference 8.2). This concludes that delays on the A3(M) are largely unchanged. The greatest change in delay is in the immediate vicinity of the Site on Purbrook Way eastbound between the A3(M) and Hulbert Road and on Hulbert Road eastbound approaching A3(M) Junction 3 in the AM Peak. As the report notes, this is consistent with increased traffic volumes and reduced spare capacity. In the PM Peak, Purbrook Way eastbound at the Hulbert Road roundabout sees a reduction in delay. This is most likely a result of changes in the distribution of trips at the roundabout affecting the gap times for vehicles entering the roundabout on this approach. For example there is a change in route choice westbound from Hulbert Road to Purbrook Way, as a result of congestion at the roundabout.

VISSIM Micro-simulation Model

- 8.108 The Transport Assessment includes the results for all scenarios including '2019 with Phase 1' and '2019 with Phase 1 and 2'. However, the worst case results for the 2026 scenario with Phase 1 and 2 are presented here for the purposes of this assessment.
- 8.109 The results are presented in terms of queues on the approaches at all junctions in the Study Area and comparative journey times on two routes in the Study Area. Delays on the approaches were recorded but they show quite varying results, and these differ to the queue results quite often and have not, therefore, been presented here.

2026 with and without Phase 1&2

- 8.110 The results for 2026 are shown in Table 8.10 to Table 8.11 for queue lengths and journey times, comparing with and without Phase 1 & 2 of the development.

Table 8.10 - 2026 Queue Length Results - with and without Phase 1&2

Queue Counter Location		Queue Length (m)			
Junction	Arm	2026 Base		2026 Phase 1&2	
		AM	PM	AM	PM
A3(M) Junction 3 / B2150 Hulbert Road	A3(M) J3 (N)	17	19	18	22
	Hulbert Road (E)	80	37	69	65
	A3(M) J3 (S)	18	31	31	38
	Hulbert Road (W)	54	44	122	50
B2150 Hulbert Road / Purbrook Way Roundabout	Hulbert Road (N)	9	99	11	315
	Purbrook Way (E)	268	37	254	165
	Hulbert Road (S)	83	410	192	91
	Purbrook Way (W)	215	368	274	340
A3(M) Junction 4 / Purbrook Way (West Roundabout)	A3(M) J4 Off-slip	37	129	37	188
	Purbrook Way (W)	133	377	131	350
Purbrook Way (W) / B&Q Havant (East Roundabout)	B & Q Exit	11	23	11	20
	Purbrook Way (E)	31	37	27	42
	Purbrook Way (W)	95	159	111	153

Queue Counter Location		Queue Length (m)			
Junction	Arm	2026 Base		2026 Phase 1&2	
		AM	PM	AM	PM
DHF Access Roundabout Junction	DHF Access Road	N/A	N/A	0	21
	Hulbert Road (S)	N/A	N/A	5	26
	Hulbert Road (N)	N/A	N/A	7	24

- 8.111 The queue results show that most approaches would see an increase in queues in 2026 with Phase 1 and 2 of the development. The most notable increases in queues are similar to Phase 1 and include Hulbert Road (W) at A3(M) Junction 3 in the AM Peak, the northbound off-slip at A3(M) Junction 4 and Hulbert Road (N), Hulbert Road (S) and Purbrook Way (E) at the Hulbert Road / Purbrook Way roundabout.
- 8.112 The queue on Hulbert Road (W) at Junction 3 increases by 68m reaching a maximum queue of 122m, for which there is available queuing space. The queue on the northbound off-slip at Junction 4 increases by 59m reaching just less than 200m, which does not block back to the main carriageway. The queues at Hulbert Road / Purbrook Way in the AM Peak increase on two arms and decrease, or stay the same, at the other arms. The increases are predicted on Hulbert Road (S) by 109m and Purbrook Way (W) by 59m. These are within the available stacking space. In the PM Peak the increases are on Hulbert Road (N) and Purbrook Way (E) by 216m and 128m respectively, with corresponding decreases predicted on the other arms. The increases appear large but the Purbrook Way (E) queue remains below 200m and is not considered to conflict with other junctions, and the Hulbert Road (N) queue would extend to 315m or 55 vehicles as a worst case.
- 8.113 The predicted reduction in queues on some approaches are a result of the higher demand in VISSIM creating a slightly different arrival profile for vehicles at the junctions, resulting in different gap opportunities at roundabouts, and hence reduced queues and delays on some approaches.
- 8.114 The new access roundabout for the Proposed Development produces minimum queuing in 2026 with Phase 2, with a maximum of 5 vehicles queuing back on the Hulbert Road (S) approach.
- 8.115 Overall the predicted increase in queues is greatest at the Hulbert Road / Purbrook Way roundabout, where the queues are predicted to increase on some arms and reduce on others with Phase 2 of the Proposed Development. However, the queues remain within available stacking space without blocking any other main junctions.

Table 8.11 - 2026 Journey Time Results - with and without Phase 1&2

Journey Time		Journey Time (sec)			
Route	Segment	2026 Base		2026 Phase 1&2	
		AM	PM	AM	PM
Route 1	South of A3(M) J4 to north of J4	16.8	16.6	16.9	16.6
	North of A3(M) J4 to A3(M) J3 Roundabout with Hulbert Road	51.0	54.9	55.5	56.4
	A3(M) J3 Roundabout to Hulbert Road / Purbrook Way Roundabout	111.5	134.8	131.1	221.5
	Hulbert Road / Purbrook Way Roundabout to A3(M) south of J4	60.7	62.2	59.8	64.5
	TOTAL Route 1	240	268	263	359

Journey Time		Journey Time (sec)			
Route	Segment	2026 Base		2026 Phase 1&2	
		AM	PM	AM	PM
Route 2	South of A3(M) J4 to Hulbert Road / Purbrook Way Roundabout	138.0	238.5	148.6	251.8
	Hulbert Road / Purbrook Way Roundabout to A3(M) J3 Roundabout with Hulbert Road	109.0	100.8	118.6	119.3
	A3(M) J3 Roundabout with Hulbert Road to north of A3(M) J4	65.8	46.3	64.3	49.3
	North of A3(M) J4 to south of A3(M) J4	18.1	17.8	18.0	17.9
	TOTAL Route 2	331	403	350	438

- 8.116 The journey time results show that the total journey times on both routes in both peak hours would increase and most notably on Route 1 northbound in the PM Peak by 91 seconds. However, some of the journey times on the individual route segments would see only a minimal increase, for example the A3(M) northbound and southbound and Hulbert Road / Purbrook Way Roundabout to A3(M) Junction 4. The greatest journey time increase is on the section of route from A3(M) Junction 3 to the Hulbert Road / Purbrook Way roundabout, which would increase by 87 seconds. This is due to the longer queues on Hulbert Road southbound approaching the roundabout.
- 8.117 Based on the above queue and journey time results, it can be concluded that the transport impact and in particular the traffic impact, is predicted to be of a moderate magnitude. The impact on driver delay is mainly focused on Hulbert Road and the Hulbert Road / Purbrook Way roundabout, rather than on the A3(M) where the impact is clearly much lower. The increase in traffic queues is considered to have a negligible effect on vulnerable receptors including pedestrians, cyclists and road safety. Overall therefore, the significance of the traffic impact is considered to be a **permanent moderate negative** direct effect.

Sensitivity Test

- 8.118 As mentioned briefly above in the Trip Generation section, the SRTM trip generation is predicting lower trips associated with the development than the TRICS analysis. Whilst the SRTM forecast flows are based on detailed planning and employment growth assumptions which form the evidence base for the South Hampshire transport strategy development process and has been the focus of this assessment, a sensitivity test has also been carried out to test the impact on the highway network that the higher development trips could have. This sensitivity test has been run in VISSIM only. The results are presented below for the worst case scenario being 2026, with Phase 1 and 2.

2026 with and without Phase 1&2

- 8.119 The results for 2026 are shown in **Error! Reference source not found.** to **Error! Reference source not found.** for queue lengths and journey times, comparing with and without Phase 1 & 2 of the development.

Table 8.12 – 2026 Queue Length Results – with and without Phase 1&2 – Sensitivity Test

Queue Counter Location		Queue Length (m)			
Junction	Arm	2026 Base		2026 Phase 1&2	
		AM	PM	AM	PM
A3(M) Junction 3 / B2150 Hulbert Road	A3(M) J3 (N)	17	19	17	21
	Hulbert Road (E)	80	37	72	77

Queue Counter Location		Queue Length (m)			
Junction	Arm	2026 Base		2026 Phase 1&2	
		AM	PM	AM	PM
	A3(M) J3 (S)	18	31	35	39
	Hulbert Road (W)	54	44	176	34
B2150 Hulbert Road / Purbrook Way Roundabout	Hulbert Road (N)	9	99	13	317
	Purbrook Way (E)	268	37	329	434
	Hulbert Road (S)	83	410	301	117
	Purbrook Way (W)	215	368	307	343
A3(M) Junction 4 / Purbrook Way (West Roundabout)	A3(M) J4 Off-slip	37	129	46	155
	Purbrook Way (W)	133	377	306	387
Purbrook Way (W) / B&Q Havant (East Roundabout)	B & Q Exit	11	23	11	21
	Purbrook Way (E)	31	37	26	40
	Purbrook Way (W)	95	159	145	144
DHF Access Roundabout Junction	DHF Access Road	N/A	N/A	1	14
	Hulbert Road (S)	N/A	N/A	15	20
	Hulbert Road (N)	N/A	N/A	9	19

- 8.120 As consistent with the main assessment, the queue results show that most approaches would see an increase in queues in 2026 with Phase 1 and 2 of the development. The most notable increases in queues are similar to the main assessment and include Hulbert Road (W) at A3(M) Junction 3 in the AM Peak and at the Hulbert Road / Purbrook Way roundabout, Hulbert Road (N) and Purbrook Way (E) in the PM Peak and Hulbert Road (S) and Purbrook Way (W) in the AM Peak Hour. In addition, the queue on Hulbert Road (W) at A3(M) Junction 4 is predicted to increase more than in the main assessment, particularly in the AM Peak Hour.
- 8.121 The queue on Hulbert Road (W) at Junction 3 increases by 122m reaching a maximum queue of 176m, for which there is still available queuing space. The queues at the Hulbert Road / Purbrook Way roundabout in the AM Peak increase on all arms with Phase 1 and 2, with the greatest increases predicted on Hulbert Road (S) by 218m and Purbrook Way (W) by 92m. These are greater than those predicted in the main assessment at just over 300m in length but are within the available stacking space. In the PM Peak the increases are on Hulbert Road (N) and Purbrook Way (E) by 218m and 397m respectively, with corresponding decreases predicted on the other arms. The increases appear large and greater than the main assessment, but the Purbrook Way (E) queue reaching 434m is considered to not conflict with other junctions, and the Hulbert Road (N) queue would extend to 317m or 55 vehicles as a worst case.
- 8.122 The queue on Hulbert Road (W) at A3(M) Junction 4 is predicted to increase by 173m in the AM Peak reaching a distance of 306m, which would bring it just back to the College Road junction at a worst case.
- 8.123 The predicted reduction in queues on some approaches are a result of the higher demand in VISSIM creating a slightly different arrival profile for vehicles at the junctions, resulting in different gap opportunities at roundabouts, and hence reduced queues and delays on some approaches.
- 8.124 The new access roundabout for the Dunsbury Hill Farm development produces minimum queuing in 2026 with Phase 2, with a maximum of 4 vehicles queuing back on both the Hulbert Road (S) and (N) approaches.

- 8.125 Overall the predicted increase in queues is greatest at the Hulbert Road / Purbrook Way roundabout, where the queues are predicted to increase on some arms and reduce on others with Phase 2 of the development. However the queues remain within available stacking space without blocking any other main junctions. Some mitigation would be required to reduce the delays at this junction.

Table 8.13 – 2026 Journey Time Results – with and without Phase 1&2 – Sensitivity Test

Journey Time		Journey Time (sec)			
Route	Segment	2026 Base		2026 Phase 1&2	
		AM	PM	AM	PM
Route 1	South of A3(M) J4 to north of J4	16.8	16.6	17.0	16.7
	North of A3(M) J4 to A3(M) J3 Roundabout with Hulbert Road	51.0	54.9	55.7	57.3
	A3(M) J3 Roundabout to Hulbert Road / Purbrook Way Roundabout	111.5	134.8	133.6	251.9
	Hulbert Road / Purbrook Way Roundabout to A3(M) south of J4	60.7	62.2	58.8	64.3
	TOTAL Route 1	240	268	265	390
Route 2	South of A3(M) J4 to Hulbert Road / Purbrook Way Roundabout	138.0	238.5	182.1	217.9
	Hulbert Road / Purbrook Way Roundabout to A3(M) J3 Roundabout with Hulbert Road	109.0	100.8	120.1	121.8
	A3(M) J3 Roundabout with Hulbert Road to north of A3(M) J4	65.8	46.3	63.7	48.5
	North of A3(M) J4 to south of A3(M) J4	18.1	17.8	18.0	17.9
	TOTAL Route 2	331	403	384	406

- 8.126 The journey time results show that the total journey times on both routes in both peak hours would increase and most notably on Route 1 northbound in the PM Peak by 122 seconds (compared to 91 seconds in the main assessment) and Route 2 in the AM Peak by 53 seconds (compared to 19 seconds in the main assessment). However the journey times on Route 1 in the AM Peak and Route 2 in the PM Peak are not predicted to increase by much in 2026 with Phase 1 and 2 of the development. On the most affected routes, some of the journey times on the individual route segments would see only a minimal increase, for example the A3(M) northbound and southbound and Hulbert Road / Purbrook Way Roundabout to A3(M) Junction 4. Consistent with the main assessment, the greatest journey time increase is on the section of route from A3(M) Junction 3 to the Hulbert Road / Purbrook Way roundabout, which would increase by 117 seconds. This is due to the longer queues on Hulbert Road southbound approaching the roundabout in the PM Peak Hour.
- 8.127 Overall therefore, the significance of the traffic impact is considered to be a **permanent moderate negative direct effect**.

8.128

Public Transport Impact

- 8.129 The scheme with the link road, bus gate at the eastern side and provision of bus infrastructure on Site allows for the safeguarding of the Havant Bus Rapid Transit System. The Cross Borough Service would operate at a frequency of four buses per hour and thus reduce journey times between Waterlooville and Havant and improve connectivity. The significance of this effect is considered to be **permanent moderate positive**.

Pedestrian and Cycling Impact

- 8.130 Pedestrian and cycle linkages would exist on site and access would be provided to the east at Leigh Park. The details would be confirmed in detail design. The significance of this effect is considered to be **neutral**.

Mitigation Measures

- 8.131 As noted above the Proposed Development includes a new site access, proposed link road, bus link and infrastructure. However, further mitigation has been proposed to reduce the private car trips to the Site with development of a Framework Travel Plan. This has been developed as part of the Transport Assessment
- 8.132 In addition, it is recommended that improvements would be required at the Purbrook Way / Hulbert Road roundabout junction to improve capacity and reduce the queues and delays. It is suggested that possible mitigation measures at the junction are investigated with Hampshire County Council as there are existing issues at this junction without development. It is likely that these could include local widening and changes to the lane markings or a signalised option to improve capacity and reduce the queues and delays.

Cumulative Effects

- 8.133 Cumulative effects have been considered in the above assessment as other developments and background growth have been incorporated in the SRTM forecast flows and consequently fed into the VISSIM model assessment.

Summary

- 8.134 This section has reviewed the likely significant transport effects of the Proposed Development.
- 8.135 The Proposed Development would include a new access junction forming a roundabout on B2150 Hulbert Road and a link road to the west, with a bus only link to the east connecting to Leigh Park.
- 8.136 The Site, currently consisting predominantly of agricultural land, is located close to the A3(M) Junction 3 between Waterlooville and the Leigh Park area of Havant. The B2150 Hulbert Road past the Site has no pedestrian footways and has a derestricted speed limit. This connects to Purbrook Way further south of the Site at an un-signalised roundabout, which currently experiences congestion. Purbrook Way leads west to Junction 4 of A3(M). The Leigh Park estate is a 20mph zone with footways and street lighting. Havant town centre is located approximately 3km south east of the Site.
- 8.137 There is an existing network of bus services, with some stops located 400m from the Site, providing routes to Havant town centre and Portsmouth Harbour. Havant and Bedhampton rail stations are located approximately 2.5km from the Site. There are some footpaths passing adjacent to the site and a bridleway (Park Lane) crossing the site connecting Leigh Park to cross the A3(M) to the north. Analysis of accident data shows accident do not exceed national average proportions except at A3(M) Junction 4 where few accident were recorded overall.
- 8.138 The transport assessment has used Transport for South Hampshire's (TfSH) Sub-Regional Transport Model (SRTM) developed by MVA Consultancy that provides the evidence base for the South Hampshire transport strategy development process, and a VISSIM micro-simulation model.

- 8.139 A base VISSIM model was developed using traffic counts undertaken in May 2011. The traffic forecasts from SRTM were used for the forecasting assessment.
- 8.140 The VISSIM model assessment shows that in 2026 with Phase 1 and 2 of the development there would be an increase in queues and delays in the local road network. In particular queues would increase at the Hulbert Road / Purbrook Way roundabout and journey time increases would be most significant travelling southbound on Hulbert Road. These impacts are offset to some extent by the significant improvements to the public transport network that would be facilitated by the site with the Cross Borough Service. It is also recommended that improvements would be required at the Purbrook Way / Hulbert Road junction to reduce the queues and delays. This would be investigated with Hampshire County Council as there are existing issues at this junction.
- 8.141 Table 8.14 summarises the findings of the transport assessment.

Table 8.14 - Summary of the Effects of Development

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Highway network under construction	Construction Management Plan in place	Temporary minor negative
Operation		
Traffic impact	Proposals incorporate site access and link road	Permanent moderate negative direct
Public transport impact	Cross Borough Service	Permanent moderate positive
Pedestrian and Cycling Impact	On-site pedestrian and cycle routes Retain existing pedestrian and cycle routes	Neutral

References

- 8.1 HA's document 'Guidelines for the Use of Micro Simulation Software' (July 2007).
- 8.2 MVA's report 'Transport for South Hampshire Evidence Base: Dunsbury Hill Farm Report' dated August 2011.

9 Air Quality

Introduction

- 9.1 This section examines the potential effect of the Proposed Development on local air quality.

Scoping Responses

- 9.2 Air Quality issues raised by respondents to the EIA Scoping Report are summarised in Table 9.1.

Table 9.1 - Scoping Response - Air Quality Issues

Issue Raised	Respondent
It is agreed that the proposed scope of work for the ES is appropriate.	Jonathan Driver, Environmental Control Officer, Havant Borough Council (comment as 23 March 2011 to the original Scoping Report).
The land is of low sensitivity in terms of the development as a receptor for the contamination issues, and there are no known potential sources other than those identified in the scoping report.	
An appropriately scoped traffic and transportation assessment and DMRB (Air Quality) assessment is proposed so no further comments.	
The position of sampling points as a representative sample should be carefully checked.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).
Ensure any dispersal or concentration effects of topography and structures in the proposed development are highlighted and explained.	
Ensure assumptions are explained, such as the increasingly stringent exhaust emission criteria.	

Key Aspects of the Project

- 9.3 The Proposed Development is expected to be carried out in phases. As noted in Section 4, Phase 1 would be located in the southern and central parts of the Site and would include a hotel, and a mix of B8 (storage and distribution), B1 (business) and B2 (general industrial) land use. Phase 2 would be located to the north of the Site. Construction of the access junction and link road would be due to commence in 2013 and last approximately 12 months. Construction of Phase 1 would be due to commence in 2014 with occupation from 2016 onwards, while construction of Phase 2 would be due to commence in 2020 with occupation from 2022 onwards.
- 9.4 The Proposed Development has the potential to affect air quality during construction from any dust raising activities or plant on site, and once the development is complete with effects from any industrial form of land use, and indirectly from changes in traffic.

Relevant Legislation, Policies and Guidelines

- 9.5 Government guidance for air quality is contained primarily within various guidance notes and planning policy statements at national, regional, and local levels as described in Section 3 of this ES.

National Planning Guidance

- 9.6 The planning guidance of general relevance for air quality is found within Planning Policy Statement (PPS) 23 Planning and Pollution Control. PPS 23 Annex 1: Pollution Control, Air and Water Quality provides more specific guidance to be taken into account in preparing policies relevant to

potentially polluting developments. This Annex should be read alongside PPS 23 and has equal weight.

Legislative Framework

- 9.7 Mandatory legislative air quality criteria are set in EU Directives that are implemented nationally by The Air Quality Standards Regulations 2010 (SI 2010/1001). Air quality is further regulated by the Air Quality (England) Regulations 2000 (SI 2000/928) and the Air Quality (England) (Amendment) Regulations 2002 (SI 2002/3043), which implement the objectives of the National Air Quality Strategy. Further details of the EU Directive limit values and National Air Quality Strategy objectives are provided below. Local air quality criteria for the key pollutants of NO₂, PM₁₀ and PM_{2.5} are given in Table 9.2.

Table 9.2 - Local Air Quality Criteria

Pollutant	Criteria	Compliance Date	
		AQS Objectives	EU Limit Values
NO ₂	Hourly average concentration should not exceed 200 µg/m ³ more than 18 times a year.	31 December 2005	1 January 2010
	Annual mean concentration should not exceed 40 µg/m ³ .	31 December 2005	1 January 2010
PM ₁₀	24-hour mean concentration should not exceed 50 µg/m ³ more than 35 times a year.	31 December 2004	1 January 2005
	Annual mean concentration should not exceed 40 µg/m ³ .	31 December 2004	1 January 2005
PM _{2.5}	UK (except Scotland): annual mean concentration should not exceed 25 µg/m ³ .	2020	-
	EU Stage 1 Limit Value: annual mean concentration should not exceed 25 µg/m ³ .	-	1 January 2015
	EU Stage 2 Limit Value: annual mean concentration should not exceed 20 µg/m ³ .*	-	1 January 2020
	Exposure Reduction: UK urban areas: target of 15% reduction in concentrations at urban background.	Between 2010 and 2020	-
	Exposure Reduction: Target of 20% reduction.	-	Between 2010 and 2020

Notes:

* indicative EU Stage 2 Limit Value to be reviewed in 2013

EU Directive Limit Values

- 9.8 In 1996, the European Union (EU) adopted a Directive on ambient air quality assessment and management (The Air Quality Framework Directive) and later supporting pollutant-specific Daughter Directives were prepared. The first Daughter Directive set legally binding limit values for ambient air concentrations of nitrogen dioxide, sulphur dioxide, particles and lead. The second Daughter Directive set limit values for concentrations of carbon monoxide and benzene. The third Daughter Directive set target values and long-term objectives for ozone, and the fourth Daughter

Directive set target values for polycyclic aromatic hydrocarbons and the metals arsenic, cadmium, mercury and nickel. The Air Quality Framework Directive and the Air Quality Daughter Directives were implemented in the UK by the Air Quality Standards Regulations 2007 (SI 2007/64).

- 9.9 In 2008, the European Commission adopted Directive 2008/50/EC on ambient air quality and cleaner air for Europe. This Directive merged the Air Quality Framework Directive and first three of the Daughter Directives and introduced new criteria for PM_{2.5}. This Directive is implemented in the UK by the Air Quality Standards Regulations 2010 (SI 2010 No.1001).
- 9.10 Where the criteria are not met, Member States are legally required to take action to comply with the limit values, and where possible to attain long-term objectives. For PM_{2.5}, there is not yet an identifiable threshold below which this pollutant would not pose a risk to human health. Therefore the approach to regulating this pollutant aims at a general reduction of pollutant concentrations in the urban background to ensure that large sections of the population benefit from improved air quality. However, to ensure a minimum degree of health protection everywhere, the exposure reduction approach is combined with a limit value.
- 9.11 The pollutant of most concern for sensitive vegetation near roads, and perhaps the best understood, is NO_x. The First EU Daughter Directive set a Limit Value for NO_x for the protection of vegetation (an annual mean of 30 micrograms /m³) to be met by 2001. This value was based on the work of the UNECE and WHO, and has been incorporated into the UK Air Quality Limit Value Regulations 2001. The policy of the UK statutory nature conservation agencies is to apply the 30 micrograms /m³ criterion in internationally designated conservation sites and SSSIs on a precautionary basis.
- 9.12 This assessment procedure was prepared in collaboration with the Joint Nature Conservation Committee and Natural England. The sites that should be considered for assessment are those for which the designated features are sensitive to air pollution, either directly or indirectly, and which could be adversely affected by the effect of local air pollution on vegetation within the following nature conservation sites SAC (SCI or cSAC), SPA, pSPA, SSSIs and Ramsar sites.

Air Quality Strategy Objectives

- 9.13 The Government's Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS) provides details of national air quality standards and objectives for a number of local air pollutants. The standards are set by expert organisations on the basis of scientific and medical evidence on effects of the particular pollutant on health. In addition the level of pollution below which health effects are expected to be minimal or low risk even to the most sensitive members of the population is defined. The objectives are targets for air pollution levels that are intended to be achieved by a specified timescale, taking account of the costs and benefits of achieving the standard, either without exception or with a permitted number of exceedences. Local authorities have a responsibility (under the Environment Act 1995) to review and assess local pollution levels against these objectives. These criteria are defined in Regulations SI 2000/928 and SI 2002/3043.
- 9.14 However, as noted above under the EU Directive Limit Values section, for some pollutants such as PM_{2.5}, it is recognised that there is no established safe level for exposure and therefore an exposure reduction objective has been introduced along with an AQS objective to ensure a minimum level of protection throughout the UK.
- 9.15 UK air quality objectives only apply in locations likely to have 'relevant exposure' – i.e. where members of the public are exposed for periods equal to or exceeding the averaging periods set for the standards.

- 9.16 Statutory responsibility for achieving EU limit values lies with the Secretary of State for Environment. Local authorities have no direct responsibility for achieving these criteria, although they should contribute to achieving these criteria through local action plans designed to reduce pollution levels against objectives in AQMAs.

Local Air Quality Management

- 9.17 Under Part IV of the Environment Act 1995, all local authorities are responsible for Local Air Quality Management (LAQM), the mechanism by which the air quality objectives are to be achieved. Under the LAQM regime, a local authority is responsible for regular review and assessment of local air quality, the findings of which are reviewed by DEFRA prior to publication by the local authority. If an area is identified as being unlikely to achieve an AQS objective and there are sensitive receptors to be exposed over the relevant exposure period, then the local authority is required to designate an AQMA and develop an action plan to improve local air quality.
- 9.18 Technical guidance (LAQM.TG(09)) has been issued to support local authorities with their review and assessment work which provides information to assist with monitoring, emissions inventories and modelling work. The assessment in this ES uses information from this technical guidance.

Regional and Local Policy

- 9.19 The Regional Spatial Strategy for South East (South East Plan) Policy NRM9: Air Quality – Strategies states that plans, programmes and planning proposals should contribute to sustaining the current downward trend in air pollution in the region through:
- Ensuring consistency with Air Quality Management Plans;
 - Reducing the environmental impacts of transport, congestion management, and support the use of cleaner transport fuels;
 - Mitigating the impact of development and reduce exposure to poor air quality through design, particularly for residential development in areas which already, or are likely to, exceed national air quality objectives;
 - Encouraging the use of best practice during construction activities to reduce the levels of dust and other pollutants; and
 - Assessing the potential impacts of new development and increased traffic levels on internationally designated nature conservation sites, and adopt avoidance and mitigation measures to address these impacts.
- 9.20 Local and regional policies relating to air quality are documented in Section 3. In summary, the relevant policies are:
- 9.21 Havant Borough Council Core Strategy Policy DM10 Pollution – Development that may cause pollution of water, air or soil or pollution through noise, smell, smoke, fumes, gases, steam, dust, vibration, light, heat, electromagnetic radiation and other pollutants will only be permitted where all of the following relevant criteria can be met:
- The health and safety of existing and future users of the site, or nearby occupiers and residents is not put at risk; and
 - National air quality standards or objectives would not be breached.
- 9.22 Other criteria are not listed here as they are applicable to only to water and lighting.

Approach to Assessment

- 9.23 The approach for the assessment was provided in the scoping report, and comments were received from HBC. These have been considered in section 2 of this report and there was not considered to be any need to refine the methodology.
- 9.24 The approach for the air quality assessment consists of the following tasks:
- A discussion of existing baseline conditions;
 - An assessment of the likely effects from construction; and
 - An assessment of the likely effects on local air quality arising once the development is complete.

Baseline Conditions

- 9.25 The existing air quality follows this methodology section, and draws information from Defra's UK-AIR information resource (Reference 9.1), from the local authority's review and assessment reports, and from national background mapping data.

Construction

- 9.26 A qualitative assessment of the impacts of nuisance dust arising during the construction of the Proposed Development has been undertaken, following guidance produced by Environmental Protection UK (EPUK) (Reference 9.2) and the Highways Agency's Design Manual for Roads and Bridges (DMRB) (Reference 9.3).
- 9.27 The existing air quality follows this methodology section, and draws information from Defra's UK-AIR information resource (Reference 9.1), from the local authority's review and assessment reports, and from national background mapping data.
- 9.28 A qualitative assessment of the impacts of nuisance dust arising during the construction of the development has been undertaken, following guidance produced by Environmental Protection UK (EPUK) (Reference 9.2) and the Highways Agency's Design Manual for Roads and Bridges (DMRB) (Reference 9.3).
- 9.29 The DMRB recommends locations of sensitive receptors within 200 metres of a construction site are identified. This includes housing, schools, hospitals and designated species or habitats within a Designated Site. The assessment has identified residential and other sensitive properties that could be at risk of being affected from nuisance dust, by considering the activities to be carried out and their duration.
- 9.30 The findings of the assessment have been assessed with reference to Greater London Authority (GLA) and the London Boroughs guidance (Reference 9.4) which although refers to London is useful in the context of schemes elsewhere when considering assessment, planning and management of control measures, and EPUK's guidance.

Operation

- 9.31 The effect of the changes in traffic has been initially compared with the scoping criteria given in the EPUK's guidance and provided below:
- Proposals that will give rise to a significant change in either traffic volumes, typically a change in annual average daily traffic (AADT) or peak traffic flows of greater than $\pm 5\%$ or $\pm 10\%$, depending on local circumstances (a change of $\pm 5\%$ will be appropriate for traffic flows within an AQMA), or in vehicle speed (typically of more than ± 10 kph), or both, usually on a road with more than 10,000 AADT (5,000 if 'narrow and congested').

- Proposals that would significantly alter the traffic composition on local roads, for instance, increase the number of HDVs (>200 movements or more per day) (professional judgement will be required, taking account of the total vehicle flow as well as the change).
- 9.32 An assessment of the change in pollutant concentrations at properties (termed receptors) within 200 metres of affected roads has been carried out for the base year (2011) and for two future years corresponding with the completion of each of the two phases of the development (2019 and 2026), both with and without the Proposed Development. The assessment was undertaken following guidance given in the Highways Agency's DMRB and the associated DMRB Screening Tool.
- 9.33 The screening method takes into account:
- AADT flows and speeds;
 - The proportion of heavy duty vehicles (HDVs);
 - Changes in future exhaust emissions due to legislation;
 - Road type; and
 - The distance between the receptor and the roads carrying the traffic.
- 9.34 These parameters and a set of empirical equations were used to calculate a traffic derived pollutant emission. This was added to a background concentration (reflecting those sources of pollution not explicitly modelled) to give an annual average pollutant concentration at selected receptors. The estimated concentrations were then compared with air quality criteria.
- 9.35 Pollutant concentrations have been estimated for the following scenarios using the 'simple' DMRB assessment methodology:
- 2011 Baseline;
 - 2019 Do Minimum (DM);
 - 2019 Phase 1 (P1);
 - 2026 Do Minimum (DM); and
 - 2026 Phase 1 and Phase 2 (P1&2).

Criteria for Assessing Significance of Impact

- 9.36 Air quality criteria set out in legislation have been provided in Table 9.1. The estimated levels of pollution in the existing and future years of assessment, and the change due to the Proposed Development, have been compared with these criteria where appropriate. Criteria for assessing the magnitude of likely impacts are provided below.
- 9.37 Descriptors for changes in ambient concentrations of NO₂ and PM₁₀ have been developed by the Institute of Air Quality Management (IAQM) and provided in the Environmental Protection UK's air quality guidance for developments. Their examples for descriptors for magnitude of change are provided in Table 9.3, described as ranging from imperceptible to large, and should be read in conjunction with their criteria for significance as detailed in Table 9.4 in the section below.

Table 9.3 - Descriptors for Changes in Ambient Concentrations of NO₂ and PM₁₀

Magnitude of Change	Annual Mean NO ₂ /PM ₁₀	No. Days PM ₁₀ >50 µg/m ³
Large	Increase/decrease >4 µg/m ³	Increase/decrease >4 days
Medium	Increase/decrease 2 - 4 µg/m ³	Increase/decrease 2-4 days
Small	Increase/decrease 0.4 – 2 µg/m ³	Increase/decrease 1-2 days
Imperceptible	Increase/decrease <0.4 µg/m ³	Increase/decrease <1 day

- 9.38 The impact significance descriptors take account of the magnitude of change (both positive and negative) and the absolute concentration in relation to the AQS objective. These descriptors are provided in Table 9.4.

Table 9.4 - Descriptors for Impact Significance for NO₂ and PM₁₀

Absolute Concentration in Relation to AQS Objective	Change in Concentration		
	Small	Medium	Large
Increase with Scheme			
Above AQS Objective with Scheme (>40 µg/m ³)	Slight adverse	Moderate Adverse	Substantial Adverse
Just below AQS Objective with Scheme (36-40 µg/m ³)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below AQS Objective with scheme (30-36 µg/m ³)	Negligible	Slight Adverse	Slight Adverse
Well Below AQS Objective with scheme (<30 µg/m ³)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above AQS Objective without Scheme (>40 µg/m ³)	Slight beneficial	Moderate Beneficial	Substantial Beneficial
Just below AQS Objective without Scheme (36-40 µg/m ³)	Slight beneficial	Moderate Beneficial	Moderate Beneficial
Below AQS Objective without scheme (30-36 µg/m ³)	Negligible	Slight beneficial	Slight beneficial
Well Below AQS Objective without scheme (<30 µg/m ³)	Negligible	Negligible	Slight beneficial

Baseline Conditions

- 9.39 The description of the baseline air quality has been drawn from the following sources:
- Local authority review and assessment studies;
 - Air quality monitoring data collated from DEFRA's UK Air Quality Information Resource (UK-Air) and local authorities; and
 - Designated ecological site information from Magic GIS web resource (Reference 9.5).

Air Pollutants

- 9.40 National assessments have demonstrated that there is no risk of carbon monoxide, 1,3-butadiene or benzene concentrations exceeding air quality criteria due to emissions from traffic anywhere in the UK. The pollutants carbon monoxide, 1,3-butadiene and benzene are therefore not considered further in this assessment. Details of the key pollutants from road traffic considered in this assessment are provided below, together with construction dust.
- 9.41 Nitric oxide (NO) and nitrogen dioxide (NO₂) are collectively termed nitrogen oxides (NO_x). The majority of NO_x emitted from vehicles is in the form of NO, which oxidises rapidly in the presence of ozone to form NO₂. In high concentrations NO₂ can affect the respiratory system, whereas NO does not have any observable effect on human health at the range of concentrations found in ambient air.
- 9.42 Particulate matter in vehicle exhaust gases consists of carbon nuclei onto which other compounds are adsorbed. These particles are less than 10 micrometres (µm) in diameter. Particles with a median diameter of less than 10 µm are referred to as PM₁₀. Diesel engines produce the majority

of particulate emissions from the vehicle fleet. Particulate matter is associated with various symptoms of ill health. Reviews by the World Health Organisation (WHO) and Committee on the Medical Effects of Air Pollutants (COMEAP) have suggested exposure to a finer fraction of particles (PM_{2.5}, which typically make up around two thirds of PM₁₀ emissions and concentrations) give a stronger association with the observed ill health effects.

- 9.43 Dust is defined as all particulate matter up to 75 µm in diameter and comprising both suspended and deposited dust. Most dust particles are too large to be inhaled but can cause eye, nose and throat irritation and can have a nuisance effect with deposition on cars, windows and property.

Local Air Quality Review and Assessment

- 9.44 All local authorities are required by the Environment Act 1995 Part IV to carry out a review and assessment of air quality. This involves examining current pollutant concentrations, estimating future concentration and comparing the future concentrations with the objectives in the AQS.
- 9.45 Where the objectives are not likely to be achieved in all relevant locations, the authority must designate these areas as AQMAs by order.
- 9.46 The Site is located within the Havant Borough Council local area. HBC has not declared any AQMAs. Following its most recent air quality review and assessment report (Reference 9.6) it was recommended that additional monitoring is undertaken to form the basis of a detailed assessment of the Park Road North Area of Havant town centre. This area is located two kilometres to the south of the proposed development.

Air Quality Monitoring

- 9.47 Measurements of pollutant concentrations can be made by deploying analytical instruments that measure continuously and record average concentrations over specified time intervals. Simpler sampling devices, such as diffusion tubes, absorb pollutants over a longer time period and are subsequently analysed at a laboratory to give an average concentration for the sampling period. National survey results from both types of monitoring are provided on Defra's UK-Air website. **Error! Hyperlink reference not valid.** All of the diffusion tube sites closed in 2007 and there were no continuous monitoring sites within HBC.
- 9.48 The closest continuous monitoring site to the Site area is in Portsmouth. This site is an urban background site located in the grounds of a school at grid reference 103607, 465686, approximately 10 km south-west of the Site. As it is an urban background site it may have concentrations similar to that of the Site. Concentrations for 2007-2010 are given in Table 9.5.
- 9.49 None of the AQS objectives were exceeded in any year, for which data were available.

Table 9.5 - Pollutant Concentrations Measured at Portsmouth's Continuous Analyser (µg/m³)

Pollutant	Statistic	2007	2008	2009	2010
NO ₂	Annual mean	23	23	22	22
PM ₁₀	Annual mean	23	n/a	n/a	n/a
	Number of exceedances of 24-hour mean	5	7	11	6
PM _{2.5}	Annual mean	-	n/a	11	n/a
AQS objective for annual mean for NO ₂ and PM ₁₀ = 40 µg/m ³ AQS objective for 24-hour mean PM ₁₀ : 24-hour mean concentration should not exceed 50 µg/m ³ more than 35 times a year AQS objective for annual mean for PM _{2.5} = 25 µg/m ³ n/a = data capture rate <75%					

- 9.50 HBC does not operate any automatic monitoring sites. It does maintain 24 sites measuring NO₂ with diffusion tubes. Two sites are located within one kilometre of the Site, details of which are displayed in Table 9.6 and Figure 9.1.
- 9.51 Bias adjustment has been applied to the diffusion tube data presented in Table 9.6 using national factors. This is carried out to 'correct' the less accurate tube measurements in line with the more accurate method of continuous monitoring.

Table 9.6 - Diffusion Tube Monitoring Sites and NO₂ Annual Mean Concentrations (µg/m³) within 1km of the Site Boundary

Monitoring Site Name	OS Grid Reference	Estimated Distance and Direction From Site	Site Type	2007	2008	2009	2010
Ramblers Way	470025, 110031	75 m (W)	Urban Centre	24.4	24.6	24.0	26.5
Cowplain Recreation Ground	351053, 383880	1 km (NW)	Urban Background	15.4	Closed 2007	-	-
AQS objective for annual mean NO ₂ = 40 µg/m ³							

- 9.52 Concentrations at both sites are well below the air quality standard annual mean objective. The Ramblers Way diffusion tube site is located about 50 metres from the A3(M) and best represents concentrations typical of the development site. However, as it is located on the west side of the A3(M), concentrations would be expected to be slightly higher at the Site due to the prevailing wind direction.

Background Concentrations

- 9.53 Annual mean background pollutant concentrations for the general area are available from DEFRA's UK-Air website; these have been estimated for 1 x 1 km grid squares covering the UK. The data are based on the extrapolation and interpolation of empirical measurements and modelled dispersion of road and industrial sources.
- 9.54 The estimated background concentrations of relevant pollutants for an average of the six grid squares (Reference 9.7) in which the Site is located are provided in Table 9.7 for the assessment years 2011 and 2019. Background concentrations are currently only available up to 2020.

Table 9.7 - Background Concentrations (µg/m³)

	2011	2019
NO _x	21.7	15.3
NO ₂	15.5	11.4
PM ₁₀	16.2	15.2

Receptors

- 9.55 The Site is located in a residential area. There are properties on Calshot Road to the east which could potentially be affected by construction dust as they are within 200 metres of the Site boundary. There is also a school, Prospect School, within 200 metres to the east of the Site boundary. There are no national or international designated ecological sites located within a one kilometre radius of the Site which could be affected. Changes in traffic travelling on roads to and from the Proposed Development could affect air quality at properties near these affected roads. These include in particular properties between Junctions 3 and 4 of the A3(M), properties to the

south of Junction 4 of the A3(M), and properties near Hulbert Road and Purbrook Way. The receptors chosen for assessment are shown in Figure 9.2.

Summary

- 9.56 Air quality in the vicinity of the Site is likely to be good, as pollutant concentrations are currently below their AQS objectives, and HBC has not currently declared any AQMAS. The Site is located in a residential area with no permitted industrial installations within a one kilometre radius. The nearest major pollutant source to the site is the A3(M). Nearby receptors include residential properties and Prospect School to the east of the site which could be affected during construction. There are no designated ecological sites within one kilometre of the Site. Properties which could potentially be affected by changes in traffic include those near the A3(M), near Hulbert Road and near Purbrook Way, which were identified as affected roads.

Identification and Assessment of Likely Effects

Temporary Impacts during Construction

- 9.57 During construction, local air quality could temporarily be affected by:
- Dust emissions from construction activities;
 - Exhaust emissions from construction plant working on site;
 - Exhaust emissions from construction vehicles travelling to and from the construction site;
 - Changes in exhaust emissions from the diversion of any vehicles travelling along the roads in the local network.
- 9.58 The level and distribution of dust emissions would vary according to duration and location of activity, weather conditions, and the effectiveness of suppression measures. According to the DMRB4, properties and ecologically designated sites within 200 metres of a construction site should be considered as these are most at risk from the nuisance effect of increased dust emissions.

Properties and Ecologically Designated Areas near the Site

- 9.59 Properties within 200 metres of the edge of the Site boundary are shown in Figure 9.2. There are 444 residential properties within 200 metres of the boundary of construction works, of which 131 are within 50 metres. In addition, there is one school (Prospect School) located within 200 metres of construction works.
- 9.60 There are no national or international ecologically designated sites within 200 metres of the site boundary.

Construction Plant

- 9.61 There may be a temporary increase in local air pollutants from exhaust emissions of plant used on a construction site. Typical plant would include excavators of various sizes for cutting and filling operations, bulldozers, and pavers and rollers for laying the road surface and compacting. The emissions generated by this plant are unlikely to be significant when compared to the emissions generated by traffic on the roads in this area.

Other Construction Vehicles

- 9.62 At this stage, no firm details are available regarding the number of construction vehicle movements. It is considered unlikely, however, in light of the proposed phasing, that there would be any risk of the EPUK criterion of 200 heavy goods vehicles per day being exceeded. As such, it is concluded that there would be no significant effect on air quality. It is expected that HGVs would access the construction site using the A3(M), while construction workers would access the site from all local roads via the proposed new access from Hulbert Road.

Mitigation for Dust

- 9.63 Mitigation measures to control dust during construction would be specified within the Construction Environmental Management Plan (CEMP). The precise measures would depend on the intended operations and the degree of severity of the dust issue. Typical measures include:
- Regular water-spraying and sweeping of unpaved and paved roads to minimise dust, and remove mud and debris;
 - Minimising the surface area of unmade roads;
 - Using wheel washes and/or shaker bars for vehicles leaving the site where appropriate to minimise the amount of mud and debris deposited on the roads;
 - Sheeting vehicles carrying dusty materials to prevent materials being blown from the vehicles whilst travelling;
 - Enforcing speed limits for vehicles on unmade surfaces to minimise dust entrainment and dispersion;
 - Dampening down of surfaces prior to their being worked;
 - Storing dusty materials away from site boundaries;
 - Constructing outer faces of stockpiled soils first to provide a barrier between tipping operations which would also act as a windbreak;
 - Seeding to grass the outward faces of temporary stockpiles and final embankment profiles;
 - Not loading spoil into dump trucks from an excessive height.
 - With effective suppression techniques, such as those given above, dust can usually be adequately mitigated.
- 9.64 On the basis that the construction would be undertaken in accordance with the GLA's Best Practice Guidance on controlling emissions, it is anticipated that residual effects would be **negligible**.

Permanent Impacts during Operation

- 9.65 The likely effects on air quality once the Proposed Development is complete relate predominantly to the changes in traffic emissions from vehicles travelling along affected roads in the study area. Pollutant emissions to air from the business and technological units associated with the Proposed Development are not expected to be significant.
- 9.66 Mitigation of air quality impacts due to traffic derived pollutants is regulated at a national and European level through the introduction of increasingly stringent exhaust emissions criteria, the Euro emissions categories. Future scenarios take into account the expected penetration into the national fleet of these increasingly cleaner vehicles.
- 9.67 Pollutant concentrations at selected receptors within 200 metres of affected roads have been modelled using the DMRB screening model for the simple assessment. Pollutant concentrations were also modelled at the Ramblers Way diffusion tube site to allow comparison of the modelled and measured concentrations.

Traffic Data

9.68 The traffic data as used in the assessment are presented in Table 9.8 and Table 9.9 below. The AADTs are presented as two-way flows.

Table 9.8 - Traffic Data Used in the Assessment (2011 and 2019)

Road Link	2011 AADT	2011 HDV%	2019 DM AADT	2019 DM HDV%	2019 P1 AADT	2019 P1 HDV %	Avg Speed (km/hr)
Hulbert Road North of Site	15342	1.3	15038	5.6	15629	5.1	37
Hulbert Road South of Site	15342	1.3	15038	5.6	16856	5.1	37
Purbrook Way between A3(M) and ASDA Roundabout	24036	2.2	26011	1.1	28040	1.0	27
Purbrook Way between College Road and A3(M)	21357	2.2	20231	1.9	20951	1.8	32
Hulbert Road between Tempest Avenue and A3(M)	32107	3.3	33747	2.5	33574	2.4	36
Purbrook Way between B2150 and Linkenholt Way	18844	2.5	34168	1.9	34301	1.9	28
Hulbert Road between Newbarn Road and Willowdene Close	8709	2.1	7903	2.4	8216	1.8	29
A3(M) North of J3	53397	5.9	66558	3.5	66328	3.5	70
A3(M) Between J3 and J4	59278	5.8	71286	3.2	72448	3.2	67
A3(M) South of J4	78369	5.2	91039	2.9	92707	2.8	67
A3(M) J3 Southbound offslip	5607	2.8	3912	6.3	3971	3.8	57
A3(M) J3 Northbound offslip	9195	3.1	7863	3.8	8489	3.8	52
A3(M) J3 Southbound onslip	8013	1.2	8209	1.2	8623	1.2	46
A3(M) J3 Northbound onslip	7004	5.2	7176	5.2	6954	5.0	46
A3(M) J4 Southbound onslip	9407	2.6	11213	0.8	11574	0.8	46
A3(M) J4 Northbound offslip	9664	2.4	10712	1.8	10923	1.7	53

Table 9.9 - Traffic Data Used in the Assessment (2026)

Road Link	2026 DM AADT	2026 DM HDV %	2026 P1&P2 AADT	2026 P1&P2 HDV %	Avg Speed (km/hr)
Hulbert Road North of Site	15520	5.7	16560	5.5	37
Hulbert Road South of Site	15520	5.7	17923	5.5	37
Purbrook Way between A3(M) and ASDA Roundabout	28480	1.0	29522	1.0	27
Purbrook Way between College Road and A3(M)	21592	1.9	21688	2.0	32
Hulbert Road between Tempest Avenue and A3(M)	34526	2.5	34203	2.4	36
Purbrook Way between B2150	35870	2.1	35950	2.0	28

Road Link	2026 DM AADT	2026 DM HDV %	2026 P1&P2 AADT	2026 P1&P2 HDV %	Avg Speed (km/hr)
and Linkenholt Way					
Hulbert Road between Newbarn Road and Willowdene Close	9209	2.2	8893	2.1	29
A3(M) North of J3	70015	3.6	69749	3.5	70
A3(M) Between J3 and J4	74259	3.2	75396	3.2	67
A3(M) South of J4	95123	2.9	96789	2.8	67
A3(M) J3 Southbound offslip	4141	6.3	4187	5.9	57
A3(M) J3 Northbound offslip	8046	3.8	8677	3.8	52
A3(M) J3 Southbound onslip	8293	1.4	8751	1.2	46
A3(M) J3 Northbound onslip	7597	5.3	7430	5.2	46
A3(M) J4 Southbound onslip	12791	0.8	13258	0.7	46
A3(M) J4 Northbound offslip	10568	1.8	10713	1.7	53

Results

- 9.69 To derive total NO₂ concentrations from the DMRB-modelled road NO_x concentrations (and hence to allow a comparison with the air quality criteria) the 'Abbot method' described in Defra's Technical Guidance LAQM.TG(09) was used. The total annual mean NO₂ was calculated from the modelled road NO_x and a background NO₂ component. The conversion was carried out using the 'NO_x to NO₂ conversion spreadsheet' Version 2.1 available from the tools on the DEFRA website. In addition to the modelled road NO_x and background NO₂ data, the NO_x to NO₂ conversion spreadsheet requires the name of the local authority, to determine regional oxidant concentrations, and the type of traffic mix, to determine the proportion of primary NO₂. The local authority used was "Havant" and the traffic mix was "All other urban UK traffic".
- 9.70 The comparison of NO₂ concentrations at Ramblers Way is shown in Table 9.11. The comparison shows that the model is underpredicting NO₂ by more than 25%, so a comparison of the Roads Contribution of NO_x was undertaken. This followed Defra's Technical Guidance LAQM.TG(09) with the resulting ratio of 2.79 shown in Table 9.11. The modelled roads contribution derived from the DMRB model for each receptor was therefore multiplied by 2.79 to derive an adjusted concentration.

Table 9.10 - Comparison of Annual Mean NO₂ Concentrations (µg/m³) at Ramblers Way

Background NO ₂	Monitored Total NO ₂	Modelled Total NO ₂	Difference % [(modelled – monitored) /monitored] x100
14.5	26.5	18.8	-29.1

Table 9.11 - Comparison of NO_x Concentrations (µg/m³) at Ramblers Way

Monitored Total NO ₂	Background NO ₂	Background NO _x	Monitored Road NO ₂ (total – background)	Monitored Road NO _x (total – background)	Modelled road contribution NO _x	Ratio of Monitored Road NO _x / Modelled Road NO _x
26.5	14.5	20.0	12.0	24.8	8.9	2.79

- 9.71 Results for these receptors are provided in Table 9.12 for NO₂ concentrations and in Table 9.14 for comparison with PM₁₀ AQS objectives. The concentrations at all properties have been compared with the air quality criteria to determine whether there are likely to be any exceedances. In addition the magnitude of changes in concentrations have been analysed and compared with EPUK guidance criteria. All concentrations were below the AQS objectives. In addition, as all changes with the Proposed Development were shown to be small or imperceptible, the significance of the effect could be considered **Negligible** according to the EPUK criteria.

Table 9.12 - Adjusted Annual Mean NO₂ Concentrations (µg/m³)

Receptor	Base (2011)	2019 DM	2019 P1	2019 P1 minus DM	2026 DM	2026 P1&P2	2026 P1&P2 minus DM
1	32.1	22.9	23.7	0.7	22.7	23.4	0.7
2	27.3	19.3	19.3	<0.1	18.9	18.9	<0.1
3	29.0	24.1	24.2	0.1	24.0	24.3	0.3
4	31.4	22.0	22.0	<0.1	21.6	21.6	<0.1

AQS Objective is 40 µg/m³

Table 9.13 - Annual Mean PM₁₀ Concentrations (µg/m³)

Receptor	Base (2011)	2019 DM	2019 P1	2019 P1 minus DM	2026 DM	2026 P1&P2	2026 P1&P2 minus DM
1	17.9	15.8	15.8	0.1	16.5	16.5	0.1
2	17.5	15.4	15.5	<0.1	16.1	16.1	<0.1
3	17.6	16.8	16.9	<0.1	16.4	16.5	<0.1
4	17.7	16.3	16.3	<0.1	16.3	16.3	<0.1

AQS Objective is 40 µg/m³

Table 9.14 - Number of Days PM₁₀ Concentrations >50 µg/m³

Receptor	Base (2011)	2019 DM	2019 P1	2019 P1 minus DM	2026 DM	2026 P1&P2	2026 P1&P2 minus DM
1	1	<1	<1	<1	1	1	<1
2	1	<1	<1	<1	<1	<1	<1
3	1	1	1	<1	<1	<1	<1
4	1	<1	<1	<1	<1	<1	<1

AQS objective: 24-hour mean concentration should not exceed 50 µg/m³ more than 35 times a year

Summary

- 9.72 Air quality in the vicinity of the Site is likely to be relatively good, as pollutant concentrations are currently below their AQS objectives, and HBC has not currently declared any AQMAS.
- 9.73 The Site is located in a residential area with no permitted industrial installations within a one kilometre radius. The nearest major pollutant source to the site is the A3(M). There are no designated ecological sites within a kilometre of the proposed site.

- 9.74 There are 444 properties within 200 metres of the development. Provided dust mitigation measures are implemented during construction, the risk to these surrounding properties from dust nuisance would be **Negligible**. Traffic travelling to and from the Site during construction would be most likely to use the A3(M) for access, with construction workers additionally using the local road network. The effect of construction traffic is expected to be **Negligible**.
- 9.75 Results of the local air quality assessment have shown that changes in concentrations of nitrogen dioxide and PM10 due to the Proposed Development were small or imperceptible at all receptors, in both future years of assessment. As concentrations would be expected to remain below the AQS objectives both with and without the Proposed Development, the overall effect on air quality is considered to be **negligible**.
- 9.76 Table 9.15 summarises the findings of the air quality assessment.

Table 9.15 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Construction Dust can cause nuisance effect	Mitigation measures would be included in the CEMP to reduce dust emissions	A temporary direct effect of neutral significance
Construction Traffic	No mitigation measures included directly	A temporary indirect effect of neutral significance
Operation		
Local air quality affected by changes in traffic	No mitigation measures within the scheme design.	A permanent indirect effect of neutral significance

References

- 9.1 <http://uk-air.defra.gov.uk/>
- 9.2 Development Control: Planning for Air Quality (2010 Update) EPUK, April 2010.
- 9.3 Highways Agency's Design Manual for Roads and Bridges (DMRB), volume 11, Section 3, Part 1, May 2007.
- 9.4 Greater London Authority (GLA), (2006); The Control of Dust and Emissions from Construction and Demolition: Best Practice Guidance, GLA, London.
- 9.5 <http://magic.defra.gov.uk/>
- 9.6 2011 Air Progress Report for Havant Borough Council, 2011 (draft).
- 9.7 Average of grid squares containing proposed site: 469500,107500; 469500,108500; 470500,108500; 470500,109500; 469500,109500; 470500,110500.

10 Noise and Vibration

Introduction

- 10.1 This chapter presents the noise and vibration assessment of the Proposed Development.

Scoping Responses

- 10.2 Noise and vibration issues raised by respondents to the EIA Scoping Report are summarised in Table 10.1.

Table 10.1 - Scoping Response - Noise and Vibration Issues

Issue Raised	Respondent
Reliance on the 2003 survey is questioned as traffic and related noise may have changed since 2003.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).
Ensure that noise impacts will be appropriately projected into the future, such as 15 years.	
Ensure there is consideration of potential noise reflection.	

- 10.3 Havant Borough Council's Scoping Opinion regarding the noise assessment, has been taken into consideration in this assessment.

Key Aspects of the Project

- 10.4 The chapter includes the relevant legislation and policy, assessment methodology, baseline description, identification of the likely significant effects during the construction and operation phases of the development on the existing noise sensitive properties, as well as suitability of the Proposed Development for noise sensitive uses. It provides recommendations on mitigation measures to minimise potential significant effects and highlights any residual impacts following the implementation of appropriate mitigation measures.
- 10.5 The following impacts have been considered;
- Construction noise;
 - Construction vibration;
 - Road traffic noise;
 - Building Services; and
 - Industrial Sources.

Relevant Legislation, Policies and Guidelines

PPG24: Planning and Noise, 1994

- 10.6 The principal source of guidance in England relating to noise and the planning system is the Planning Policy Guidance 24 - Planning and Noise, dated September 1994.
- 10.7 PPG24 gives guidance to Local Authorities in England on how to use their planning powers to minimise the impacts of noise. It outlines the considerations to be taken into account in determining planning applications, both for noise sensitive developments and for those activities which generate noise, without placing unreasonable restrictions on development or adding unduly to the cost and administrative burdens of business. In Annex 3 it refers to the Noise Insulation Regulations. It refers to BS 6472 for advice on vibration levels likely to cause complaint. Noise

from construction sites and industrial and commercial developments is considered in Annex 3 and reference made to both BS 5228 for general advice on construction noise mitigation, together with methods for predicting noise from construction sites and BS4142 for assessing the likelihood of complaint from noise associated with fixed installations. BS 6472, BS 5228 and BS 4142 have all been updated since PPG24 was written; the latest versions have been used in this assessment.

BS8233: Sound Insulation and Noise Reduction for Buildings – Code of Practice, 1999

- 10.8 The Code of Practice defines a range of internal $dB_{L_{Aeq}}$ noise levels for different types of room during their periods of use. For living rooms, a 'good' standard is defined as 30 $dB_{L_{Aeq}}$ and a 'reasonable' standard as 40 $dB_{L_{Aeq}}$. For bedrooms, the corresponding levels are 30 $dB_{L_{Aeq}}$ and 35 $dB_{L_{Aeq}}$ respectively.
- 10.9 As the typical noise reduction for a dwelling facade with closed thermally double glazed window set in a brick/block wall is typically 33 dBA, these 'good' and 'reasonable' internal noise level standards equate to external levels of approximately 63 $dB_{L_{Aeq}}$ and 73 $dB_{L_{Aeq}}$ for living rooms and to approximately 63 $dB_{L_{Aeq}}$ and 68 $dB_{L_{Aeq}}$ for bedrooms.

World Health Organisation (WHO): Community Noise, 1995

- 10.10 The WHO recommends that target noise levels in outside recreational areas such as gardens and patios should not exceed 50-55 $dB_{L_{Aeq}}$ during their periods of use. The WHO acknowledges that these target levels will be exceeded in many urban areas.
- 10.11 These guidelines state that for good sleep, the L_{AMAX} noise levels should not exceed approximately 45dB more than 10-15 times per night, (this was updated in the night noise guidelines (2009) to 42dB L_{AMAX}).
- 10.12 In accordance with the WHO guidelines, the noise level within the building has been taken to be 15dB less than the noise level outside the building, assuming that the window is partially open.

Regional and Local Planning Policies

- 10.13 The following policies, set out in Chapter 3 above, are relevant to this topic:
- Policy NRM10 - Noise; and
 - Policy DM10 - Pollution.

Approach to Assessment

- 10.14 This section provides details of calculation methodologies and guidance documents used in undertaking the noise and vibration assessments described in this report.

Construction Noise and Vibration

- 10.15 The construction noise and vibration impacts associated with on-site activities from the proposed development will be assessed in accordance with the guidelines given in BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 - Noise and Part 2 - Vibration. The assessment will address the impact at residential receptors and will provide relevant information to the ecology specialist for assessment of the impacts on bird populations.

BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 - Noise

- 10.16 Part 1 of the Code of Practice for Noise and Vibration Control on Construction and Open Sites provides guidance on the methods that can be used to predict and measure noise from construction activities and how to assess the impact on those exposed to it. In particular Annex F sets out the methods of estimating noise from construction sites which take into account distance, ground effects, reflections from surfaces, and screening by obstacles.

- 10.17 Annexes C and D of Part 1 of the Code of Practice provide generic source noise data for various items of plant used on open sites which can be used in the absence of measured data.
- 10.18 Part 1, Annex E 'Significance of noise effects' of BS5228 presents various methods of determining the significance of noise effects due to construction works. In this assessment, the ABC method detailed in Annex E.3.2 has been used, where for the appropriate period (night, evening/weekends or day), the measured ambient noise level is rounded to the nearest 5 dB. This is then compared with the total noise level, including construction. If the total noise level exceeds the appropriate category value, then a significant effect is deemed to occur. The example threshold for significant effects at dwellings is shown below in Table 10.2

Table 10.2 - Example Threshold of Significance Effect at Dwellings

Assessment Category and Threshold Value Period (L_{Aeq})	Threshold Value, in Decibels (dB)		
	Category A	Category B	Category C
Night-time (23:00-07:00)	45	50	55
Evenings (19:00-23:00 weekdays) and weekends (13:00-23:00 Saturdays and 07:00-23:00 Sundays)	55	60	65
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75

- 10.19 The values in Category A, B and C are the threshold values to be used when ambient noise levels (when rounded to the nearest 5 dB) are less than, equal to, or higher than the values in Category A column, respectively.

BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 2 - Vibration

- 10.20 Part 2 of the Code of Practice for Noise and Vibration Control on Construction and Open Sites gives guidance on methods for measuring vibration and how to assess its effects on the environment and people. The main vibration impacts are likely to arise from piling activities or heavy construction vehicle movements near sensitive receptors. Annex B gives guidance on the significance of vibration effects in terms of human response to vibration (see Table 10.3) and structural response to vibration (see Table 10.4)

Table 10.3 - Guidance on Effects of Vibration Levels Perceptible to Humans

Vibration Level	Effect
0.14mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration
0.3mm/s	Vibration might be just perceptible in residential environments
1.0mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents
10mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level

Table 10.4 - Transient Vibration Guide Values for Cosmetic Damage

Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures	50mm/s at 4 Hz and above	50mm/s at 4 Hz and above
Industrial and heavy commercial buildings		
Unreinforced or light framed structures	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

- 10.21 Annex D of Part 2 of the Code of Practice provides some historical measured vibration levels for various piling methods and Annex E gives empirical formulae for the prediction of the resultant peak particle velocity vibration levels for various types of piling. The formulae found in Annex E can be used to estimate the vibration levels when detailed information about the piling method is known. If only general information is known about the piling activities then a range of levels can be obtained from the historical data presented in Annex D.

Operational Noise

- 10.22 The guidance documents used for assessing the potential impacts of fixed and mobile noise sources within the development, once it is operational, are described below. There are no known sources of vibration which could result in significant impacts, and therefore operational vibration impacts have not been considered.

BS 4142: 1997 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas

- 10.23 BS 4142:1997 describes methods for determining and assessing noise levels from fixed plant with a view to determining the likelihood of complaints. This will be used to determine the noise impact from the external plant in the neighbourhood area.
- 10.24 The likelihood of complaints about noise from the occupiers of nearby residential properties can be assessed using the method described in BS4142:1997. This method compares the rating noise level to the measured background noise level in the absence of the source. Rating noise level is defined as the noise level from the source, adjusted for certain acoustical features. It is measured in terms of dB L_{Aeq} which is an energy based acoustic indicator. The standard defines the 'specific noise level' as the L_{Aeq} of the source, and the 'background level' as the L_{A90} level without the source operating.
- 10.25 Guidance on how to measure the background noise level, L_{A90} , is also provided in the standard. The length of measurement should be sufficient to obtain a representative value for the background noise level and should cover all periods when the specific noise will operate.
- 10.26 The standard states that "Certain acoustic features can increase the likelihood of complaint over that expected from a simple comparison between the specific noise level and the background noise level. Where present at the assessment location, such features are taken into account by adding +5 dBA to the specific noise level to obtain the rating noise level. A +5 dBA correction is applied if one or more of the following features occur, or are expected to be present for new or modified noise sources:
- The noise contains a distinguishable, discrete, continuous note (whine, hiss, screech, hum, etc);
 - The noise contains distinct impulses (bangs, clicks, clatters, or thumps); and

- The noise is irregular enough to attract attention.

10.27 The standard then rates the likelihood of complaints by comparing the rating noise level with the background noise level:

- Where the rating noise level is more than 10 dB above the background level, then complaints are likely;
- Where the rating noise level is more than 10 dB below the background noise level, then this is a positive indication that complaints are unlikely; and
- Where the rating noise level is 5 dB above the background noise level, then this is of marginal significance.

Road Traffic Noise

10.28 The impacts of road traffic noise generated during the construction and the operation of the development on the existing road network would be assessed in accordance with the methods in the DMRB which uses calculation procedures from the Calculation of Road Traffic Noise.

Department for Transport Memorandum, Calculation of Road Traffic Noise, 1988

10.29 The impacts of road traffic noise generated during the construction and the operation of the development on the existing road network would be assessed in accordance with the methods in the DMRB which uses calculation procedures from the Calculation of Road Traffic Noise.

10.30 The Department for Transport Memorandum, 'Calculation of Road Traffic Noise' provides methods for measuring and calculating noise levels from road traffic, which are assessed over an 18 hour period from 06:00 to 24:00, using annual average weekday traffic (AAWT) flows. The basic noise level for a road segment can be calculated using the traffic flow, traffic speed and percentage heavy vehicles for a road segment. The traffic data will be based on the construction methods that are to be employed and information from the traffic assessment (TA).

Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7 (DMRB 11:3:7)

10.31 The advice note entitled 'Design Manual for Roads and Bridges, Volume 11, Section 3, Part 7 HD 213/11 Noise and Vibration' dated 2011 provides guidance on the assessment of the impacts that road projects may have on levels of noise and vibration. Where appropriate, this advice may be applied to existing roads.

10.32 It provides guidance on the significance of changes in road traffic noise, identifying that changes in noise smaller than 1 dBA are not perceptible in the short term. Assuming no changes to percentage composition of heavy goods vehicles or traffic speeds, an increase in traffic volume of 25% is required to alter the noise levels by 1 dBA.

10.33 The advice note gives an example classification of magnitude of impacts for opening year road traffic noise impacts, as shown in Table 10.5.

Table 10.5 - DMRB Noise Changes and Magnitude of Opening Year Impacts

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

- 10.34 The advice note also gives an example classification of magnitude of impacts for design year road traffic noise impacts, as shown in Table 10.6 These will not be used in this assessment, as all traffic data is for the opening year.

Table 10.6 - DMRB Noise Changes and Magnitude of Design Year Impacts

Noise change, $L_{A10,18h}$	Magnitude of Impact
0	No change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

- 10.35 Although advice is given on the magnitude of impacts, no specific guidance is provided on the significance of the effect of these changes.

Baseline Conditions

- 10.36 This section describes the baseline noise conditions.

Sensitive Areas

- 10.37 The Site is situated on undeveloped land between Waterlooville and Leigh Park on the north western side of Havant Borough. The closest residential areas are located to the east of the development site, in Leigh Park.
- 10.38 The nearest noise sensitive receptors include properties on Woolston Road and Calshot Road, as well as the residential development off Woolston Road, which is currently under construction. Non-residential noise sensitive receptors include the new school within the new development and Park Community School. The proposed new noise sensitive receptors include the proposed hotel and offices.
- 10.39 There are properties at a similar distance from the development on the opposite side of the A3(M). It is assumed that the most noise sensitive are to the east of the road, the A3(M) will be more effective at masking the noise from the development to the west of the site.

Noise Survey

- 10.40 On the 12th April 2011, a noise survey was carried out at the Site and in the surrounding area. The purpose of the survey was:
- To determine what the existing noise sources are which may affect the study area; and
 - To take noise measurements which can be used to predict the noise impact.
- 10.41 Ten-minute indicative noise measurements were taken at 6 locations, 5 were along the perimeter of the Site, the remaining location was sited next to a noise sensitive property at Leigh Park. These locations are shown in Figure 10.1.
- 10.42 The weather was fair and dry throughout the noise measurements and the wind speeds were low. The weather conditions were considered suitable for ambient noise measurements.
- 10.43 Calibration of the sound level meters, microphones and calibrators used for the survey is traceable to UKAS accredited laboratories and are within their respective calibration dates. Furthermore the sound level meters and microphones were calibrated prior to and after the measurements. No significant drift in calibration was observed.

- 10.44 Traffic flows were counted during the duration of each of the measurements, where possible. During the survey the dominant source of existing noise in the study area was road traffic.
- 10.45 The background noise levels were measured to be around 49-57dB L_{A90} on the Site, this noise level increased closer to the A3(M). The ambient noise level was around 54-60dB L_{Aeq} .
- 10.46 The noise levels at the nearest noise sensitive property, Calshot Road, were 54-57dB L_{Aeq} , and 49-51dB L_{A90} .
- 10.47 All measurements were taken on a Tuesday. It is possible that noise levels may be quieter at weekends. The measurements results are provided in Appendix 10.1.
- 10.48 The noise measurements were taken a couple of months before the A3 tunnel at Hindhead was fully operational. This tunnel is about 25 miles from the proposed site and the change in road traffic is unlikely to alter the existing noise levels by even 1dB.

Identification and Assessment of Likely Effects

Construction Noise and Vibration

- 10.49 At the time of producing this report, a detailed construction programme was not available. Section 5 of this ES provides a list of standard construction machinery and earthwork equipment typically used for construction works. A typical inventory of machinery and equipment to be used during construction could include, but not be limited to, the equipment in Table 10.7. At this stage it is not known which type of piling would be used at this site, but vibratory is the noisiest and produces high levels of vibration.

Table 10.7 - Construction Plant

Construction Plant	Reference	Activity Equivalent Continuous Sound Pressure Level, dB L_{Aeq} at 10m	Drive-by Maximum Sound Pressure Level in L_{AMAX} , dB at 10m
Dump Trucks	Table C2-30 and 31	79dB	87dB
Articulated Dump Trucks	Table C2-32 and 33	74dB	81dB
Tippers	Table C8-20	79dB	-
Lorry	Table C2-34	-	80dB
Tracked Excavators	Table C2-14	79dB	-
Tracked Mobile Cranes	Table C3-29	70dB	-
Vibratory Rollers	Table C2-39	74dB	-
Rubber-tyre Rollers	Table C2-37	79dB	-
Cement Mixers	Table C4-18 and 19	75dB discharging 71dB idling	-
Bitumen Sprayers/Asphalt Paver	Table C5-31	77dB	-
Cable Percussion Drilling Rig	Table C2-43	74dB	-
Vibratory Piling Rig	Table C3-9	88dB	-
Large rotary bored piling rig	Table C3-14	83dB	-
Scrapers	Table D9-12	90dB	-
Wheeled Backhoe Loader	Table C2-8	68dB	-
Graders	Table C6-31	86dB	-
Dozers	Table C2-12	81dB	-

Compactors	Table D3-120	89dB	-
Water Bowser	Table C6-37	81dB	-

10.50 The construction noise calculations assume free-field conditions to enable direct comparison with the measured ambient noise levels at the noise-sensitive receivers. The approximate distance between the closest noise sensitive properties and the edge of the Site are shown below in Table 10.8

10.51 In practice, it is likely that they would be located further away from noise-sensitive properties during the majority of the construction period, minimising the impacts. For all noise sensitive receptors the calculations assume 'soft ground' conditions between source and receiver.

Table 10.8 - Distance from the Site to the Property, Phase 1 and Phase 2

Property	Distance to the Edge of the Site (m)
New School, Leigh Park	115m to edge of development (50m to new road)
Closest property in residential area under construction, Leigh Park	65m to edge of development (10m to new road)
111 Ramsdale Lane	120m to edge of development
56 Newmer Court	(40m to new road)
2-8 Larkwhistle Walk and 1-12 Hockham Court	75m edge of development
Proposed Hotel	(30m to new road) 75m to edge of development plot

10.52 These predictions do not take into account any screening effects from any bunds or barriers. Assuming an item of equipment could be in operation during at least 50% of a typical assessment period (i.e. a full working day), it can be shown that the resulting noise levels in dB L_{Aeq} at various receiver distances would be expected as shown in Table 10.9

Table 10.9 - Likely Construction Noise Levels at Various Distances for Individual Plant with 50% On-Time

Construction Plant	Construction Noise dB L_{Aeq} at Receiver						
	@10m	@30m	@40m	@50m	@65m	@75m	@115
	Residential Area under Construction, Leigh Park - Distance to New Road	Proposed Hotel - Distance to New Road	56 Newmer Court - Distance to New Road	New School, Leigh Park - Distance to New Road	Residential Area under Construction, Leigh Park - Distance to Development	Proposed Hotel, 2-8 Larkwhistle Walk and 1-12 Hockham Court - Distance to Development	New School, Leigh Park - Distance to Development
Dump Trucks	76dB	66dB	63dB	61dB	58dB	56dB	51dB
Articulated Dump Trucks	71dB	61dB	58dB	56dB	53dB	51dB	46dB
Tippers	76dB	66dB	63dB	61dB	58dB	56dB	51dB
Lorry (pass by)	77dB	67dB	64dB	62dB	59dB	57dB	52dB
Tracked Excavators	76dB	66dB	63dB	61dB	58dB	56dB	51dB
Tracked Mobile Cranes	67dB	57dB	54dB	52dB	49dB	47dB	42dB

Construction Plant	Construction Noise dB L _{Aeq} at Receiver						
	@10m	@30m	@40m	@50m	@65m	@75m	@115
	Residential Area under Construction, Leigh Park - Distance to New Road	Proposed Hotel - Distance to New Road	56 Newmer Court - Distance to New Road	New School, Leigh Park - Distance to New Road	Residential Area under Construction, Leigh Park - Distance to Development	Proposed Hotel, 2-8 Larkwhistle Walk and 1-12 Hockham Court - Distance to Development	New School, Leigh Park - Distance to Development
Vibratory Rollers	71dB	61dB	58dB	56dB	53dB	51dB	46dB
Rubber-tyre Rollers	76dB	66dB	63dB	61dB	58dB	56dB	51dB
Cement Mixers	72dB	62dB	59dB	57dB	54dB	52dB	47dB
Bitumen Sprayers/ Asphalt Paver	74dB	64dB	61dB	59dB	56dB	54dB	49dB
Cable Percussion Drilling Rig	71dB	61dB	58dB	56dB	53dB	51dB	46dB
Vibratory Piling Rig	85dB	75dB	72dB	70dB	67dB	65dB	60dB
Large rotary bored piling rig	80dB	70dB	67dB	65dB	62dB	60dB	55dB
Scrapers	87dB	77dB	74dB	72dB	69dB	67dB	62dB
Wheeled Backhoe Loader	65dB	55dB	52dB	50dB	47dB	45dB	40dB
Graders	83dB	73dB	70dB	68dB	65dB	63dB	58dB
Dozers	78dB	68dB	65dB	63dB	60dB	58dB	53dB
Compactors	86dB	76dB	73dB	71dB	68dB	66dB	61dB
Water Bowser	78dB	68dB	65dB	63dB	60dB	58dB	53dB

Assessment of Noise Impacts

- 10.53 The likely significant effects of the resulting noise levels are considered below.
- 10.54 The ambient noise level measurements taken around the perimeter of the site were measured at between 54 and 60dB L_{Aeq}. Therefore according to the BS5228 ABC method, Category A values would apply as a construction noise limit. Construction noise levels, when combined with ambient noise levels in the areas, should therefore not exceed 65 dB L_{Aeq} during day-time periods 07:00-19:00 and on Saturdays 07:00-17:00.
- 10.55 According to section 5 of this ES; subject to agreement with the Borough Council's Environmental Health Department, the proposed construction working hours within the site are likely to be:
- Weekdays (Monday to Friday): 0800 to 1800 hours; and
 - Saturdays: 0800 to 1300 hours.
- 10.56 Therefore, no construction work would be carried out on Sundays or Public Holidays or during night-time hours.
- 10.57 In order to avoid significant effects at the sensitive receivers, the calculations below indicate that contributions from construction activities should be 64 dB L_{Aeq} or lower.

Table 10.10 - Construction Noise Limits

Construction Activity Period (L_{Aeq})	Noise Levels in dB L_{Aeq}			
	Ambient Noise	Construction Noise	Combined Ambient and Construction Noise	Threshold Value
Daytime (07:00-19:00) and Saturdays (07:00-17:00)	54-57dB	64	65	65

- 10.58 It was shown in Table 10.9, that at 10m from the Site, all activities could exceed 64 dB L_{Aeq} , and by up to 23 dB (A) resulting in 'major' noise impacts. However, it is expected that the noise levels generated by only a few individual activities would exceed this limit value within 50m of the construction activities; these are scrapers, graders, compactors and piling.
- 10.59 The boundary of each of the plots are expected to be more than 50m from the existing properties, with just the works to the access road expected to occur between 10 and 50m.
- 10.60 The cumulative effects from a number of activities occurring at the same time would be higher, however, it is not possible to know at this stage what equipment would be operational at the same time, or their location on the Site. This construction assessment does not take into account any noise mitigation measures.
- 10.61 When the construction methods are established, it is recommended that a more detailed assessment is undertaken to identify the likely noise impacts and to determine the exact nature of mitigation measures. An assessment should be based on the guidance in BS 5228:2009.
- 10.62 For minimising construction impacts, it may be necessary to employ a combination of quieter plant/equipment in conjunction with good working practices such as careful selection of working hours and activity durations. In addition, noise barriers and enclosures may need to be considered around some of the fixed plant/activities. During the construction phase, measures should be implemented by way of an enforceable noise management plan. A number of mitigation measures and good working practices are described below;
- Where appropriate noise barriers should be in use throughout the works between noisy activities and noise-sensitive receivers. For example, BS 5228 allows an approximate attenuation of 5 dB to be adopted in the cases where there is a barrier, building or other topographic feature between the source and the receiving position, and the top of the plant is just visible to the receiver over the noise barrier. In situations when the noise screen completely hides the source from the receiver, an attenuation of 10 dB can be assumed. The effectiveness of barriers at distances beyond several hundred metres is assumed to be zero, irrespective of the amount of screening.
 - All vehicles and mechanical plant used for the purpose of the works should be fitted with effective exhaust silencers and should be maintained in good and efficient working order.
 - All compressors and generators should be 'sound reduced' models fitted with properly lined and sealed acoustic covers which should be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools should be fitted with mufflers or suppressors of the type recommended by the manufacturers and should be kept in a good state of repair.
 - Machines in intermittent use should be shut down in the intervening periods between work or where this is impracticable, throttled down to a minimum.
 - The site compound and static machines should be sited as far as is practicable from inhabited buildings.

- Where practicable, plant with directional noise characteristics should be positioned to minimise noise at adjacent properties.
- Concrete mixers should not be cleaned by hammering the drums. When handling materials, care should be shown not to drop materials from excessive heights.

10.63 The local residents should be kept informed of the progress of the works. Information should include when and where the activities will be taking place and how long they are expected to last. The contractor or company carrying out work on site should appoint a responsible person to liaise with the public. All noise complaints should be effectively recorded, investigated and addressed.

10.64 The noise level at the proposed hotel, which may be operational whilst building works are still being carried out, can be reduced by careful planning of the phasing of the construction works.

Assessment of Haul Routes

10.65 At this stage, the haul route and the number of average daily additional construction vehicles is unknown. However, based on the traffic figures provided, which are discussed in the next section, and as a guide, 370 additional heavy good vehicles (construction vehicles) would be required a day in order to increase the noise levels by a perceptible 1dB over an 18 hour period on even the quietest of the roads in the study area. This does not take into account the annoyance caused by each individual construction vehicle pass-by on nearby residents.

10.66 The noise from construction workers is not expected to exceed the number of additional vehicles during the operation of the Site. The assessment of traffic during the operation of the site has been discussed in the section below.

Assessment of Vibration Impacts

10.67 Vibration levels from typical mobile construction equipment are generally imperceptible at distances greater than around 20m from the source. The delivery routes used by trucks and lorries should avoid residential areas as far as possible. Where possible, vibration generating machinery should be situated away from the noise-sensitive receivers. These measures would help minimise noise impacts as well as vibration.

10.68 Activities such as piling can cause much higher vibration levels which in some cases may cause damage to properties, as outlined in Table 10.4.

10.69 These activities are also likely to cause annoyance and discomfort to the local residents and could result in complaints, as outlined in Table 10.3.

10.70 The construction of foundations for the new buildings may require piling. It is difficult however to accurately predict the propagation of vibration without full details of the plant to be used and the ground conditions between source and receiver. As a consequence an indicative assessment has been provided below, using percussive piling, in order to inform the decision process on potential solutions.

10.71 Annex E of BS 5228-2:2009 provides a method for the prediction of the peak particle velocity (PPV) at variable distances from specific construction works. These calculations assume continuous ground conditions between source and receiver and provide a rough indication of the levels which may be experienced.

10.72 Table 10.11 gives predicted peak particle velocity levels in mm.s^{-1} from percussive piling works, for different ground conditions at the pile toe, assuming hammer energy of 30 KJ. Distances given are along the ground surface in metres.

Table 10.11 - Predicted PPV Levels from Percussive Piling Assuming a Hammer Energy of 30 KJ

Ground Conditions	Peak Particle Velocity (mm.s ⁻¹)					
	10m	25m	50m	100m	200m	250m
Pile driven to refusal	43.4	17.6	7.2	4.2	2.9	2.2
Pile toe being driven through stiff cohesive soil	26.0	10.6	4.3	2.5	1.7	1.3
Pile toe being driven through soft cohesive soil	8.7	3.5	1.4	0.8	0.6	0.4

- 10.73 Comparing Table 10.11 with Table 10.3 and Table 10.4 shows that vibration levels may be perceivable at all distances considered but within 40m of the works vibration levels might be high enough to cause cosmetic damage to some structures. It is important to note that the values given in Table 10.4 are for well maintained and structurally sound properties and should be considered an absolute maximum not an allowable level.
- 10.74 The boundaries of each of the plots are expected to be more than 50m from the existing properties, with just the works to the access road expected to occur within 50m. During the road construction the nearest receptors are 10m away from the Site boundary. Where not possible to avoid piling within 40m of a sensitive property, alternatives to percussive piling should be considered. According to BS5228-Part 2, examples would include the use of continuous flight auger injected piles, pressed-in preformed piles, auger bored piles, or possibly impact bored piles in preference to driven piles.
- 10.75 As with the good working practices for noise, the local residents should be kept informed of the progress of the vibration works. Information should include when and where the activities will be taking place and how long they are expected to last. The contractor or company carrying out work on site should appoint a responsible person to liaise with the public. All vibration complaints should be effectively recorded, investigated and addressed.
- 10.76 It is recommended that a more detailed assessment prior to the commencement of piling activities, when the methods have been established, and that regular on site monitoring during the works is conducted. It may be necessary to re-home some of the closest residents for short periods during the works, subject to results of detailed assessment and monitoring.

Road Traffic Noise Assessment

- 10.77 Traffic flows were provided in the Traffic Assessment (TA) for the base scenario, the expected Phase 1 opening year (2019) with and without the development, and Phase 2 opening year (2026) with and without Phase 1 and Phase 1 and 2. Traffic flows were not available for the design year, due to the uncertainty of other future developments in the area.
- 10.78 An increase in traffic flows by 25% or a decrease by 20% would result in a 1 dB noise change and this would need to be considered as an impact.
- 10.79 The resulting noise changes were predicted to be negligible (less than 1 dB (A)) on all of the roads, for all compared scenarios. Table 10.12 does not include the %HGV and speed information; however, the noise predictions did take these into account.

Table 10.12 - Traffic Noise Predictions

Road	Section	Direction	Total Number of Vehicles- AAWT 18 hr					Predicted Basic Noise Level at 10m from the Road (dB)					Noise Differences		
			Baseline 2019	2019 with Phase 1	Baseline 2026	2026 with Phase 1	2026 with Phase 1&2	Baseline 2019	2019 with Phase 1	Baseline 2026	2026 with Phase 1	2026 with Phase 1&2	Baseline Versus Phase 1-2018	Baseline Versus Phase 1-2026	Baseline Versus Phase 1 and 2-2026
Hulbert Road	North of Site	Northbound	11467	11496	11571	12018	11861	70.2	70.3	70.4	70.6	70.6	0.1	0.2	0.3
		Southbound	4114	4709	4516	5188	5317								
Hulbert Road	South of Site	Northbound	11467	12280	11571	12749	12634	70.2	70.7	70.4	70.9	71.0	0.4	0.5	0.6
		Southbound	4114	5200	4516	5749	5964								
Purbrook Way	between A3(M) and ASDA Roundabout	Westbound	12122	13408	14188	14725	14950	70.1	70.4	70.5	70.6	70.6	0.3	0.1	0.2
		Eastbound	14688	15494	15168	15380	15480								
Purbrook Way	between College Road and A3(M)	Westbound	9914	10435	10541	10629	10663	70.3	70.5	70.6	70.6	70.6	0.1	0.0	0.0
		Eastbound	11731	11983	12558	12583	12539								
Hulbert Road	between Tempest Avenue and A3(M)	Westbound	18271	18120	18455	18279	18174	73.1	73.1	73.2	73.2	73.2	0.0	-0.1	-0.1
		Eastbound	16835	16807	17462	17353	17407								
Purbrook Way	between B2150 and Linkenholt Way	Westbound	19754	19833	20715	20776	20992	71.8	71.8	72.0	72.0	72.0	0.0	0.0	0.0
		Eastbound	15510	15568	16306	16077	16110								
Hulbert Road	between Newbarn Road and Willowdene Close	Northbound	5062	5183	6241	6107	5731	65.6	65.7	66.3	66.2	66.1	0.1	0.0	-0.2
		Southbound	3207	3414	3391	3564	3574								
A3(M)	North of J3	Northbound	34366	34119	36704	36504	36428	81.4	81.4	81.7	81.6	81.6	0.0	0.0	0.0
		Southbound	34025	34036	35238	35256	35241								
A3(M)	Between J3 and J4	Northbound	35037	35793	37084	37561	37752	81.4	81.4	81.5	81.6	81.6	0.1	0.0	0.1
		Southbound	38513	38954	39525	39945	40027								
A3(M)	South of J4	Northbound	46089	47060	47912	48473	48724	82.4	82.5	82.6	82.7	82.7	0.1	0.1	0.1
		Southbound	48534	49298	50956	51662	51876								
A3(M) J3	Southbound offslip	Southbound	4212	4275	4459	4501	4508	67.9	67.6	68.1	68.0	68.1	-0.2	-0.1	0.0
	Northbound offslip	Northbound	8468	9142	8665	9185	9345	69.7	70.0	69.8	70.0	70.1	0.3	0.3	0.3
	Southbound onslip	Southbound	8838	9284	8929	9329	9422	68.5	68.7	68.6	68.7	68.8	0.2	0.2	0.2
	Northbound onslip	Northbound	7727	7489	8181	8084	8001	68.5	68.4	68.8	68.7	68.7	-0.2	-0.1	-0.1
A3(M) J4	Southbound onslip	Southbound	11658	12033	13298	13631	13784	69.6	69.8	70.2	70.3	70.4	0.1	0.1	0.1
	Northbound offslip	Northbound	11444	11669	11290	11383	11445	71.1	71.1	71.0	71.0	71.0	0.1	0.0	0.0

Impact of Local Traffic on the Proposed Development

- 10.80 The most noise sensitive building within the Proposed Development is the hotel, other noise sensitive buildings may include offices, which are less sensitive and sited further from the A3(M).
- 10.81 Advice within BS8233 states that although hotels are often built in noisy locations for convenience, they recommend that limits for noise levels within hotel bedrooms ought to be the same as limits for residential dwellings and that double windows and air conditioning may be necessary. Hotel Operators may also impose their own requirements for the control of noise levels.
- 10.82 The impact of noise from the A3(M), has been predicted at the hotel, with the proposed Development 2026 (Phase 1 and 2); this was predicted to be 69dB $L_{A10-18hr}$, or 67dB L_{Aeq} .
- 10.83 In order to achieve internal bedroom noise levels, which according to BS8233 are good (30dB L_{Aeq}) or reasonable (35dB L_{Aeq}), noise levels outside the hotel would need to be less than 63dB or 68dB L_{Aeq} respectively; with the windows shut and assuming closed thermally double glazed window set in a brick/block wall. Therefore, it should be possible to achieve reasonable noise levels within the bedrooms.
- 10.84 However, these noise predictions are worst case and assume flat earth. Hulbert Road, which has been built on an embankment, and the slip road would screen noise from some of the A3(M). This should be reassessed at the detailed stage, when topography data is available. The noise measurements taken at the proposed site of the hotel were in the region of 57-60dB L_{A10} and the ambient noise level was 56-58dB L_{Aeq} .
- 10.85 At the design stage, it is expected that this building could be built to acoustic specifications which would improve the internal noise level within the bedrooms, and the internal layout could be designed such that the windows overlook the quietest facade of the building, avoiding service areas.
- 10.86 If there is an impact, a small noise barrier could be erected, which may reduce the effect at the new hotel.

Noise from the Proposed Development

Impact of Access Traffic on the Proposed Development

- 10.87 The traffic assessment provided 18 hour annual average weekday traffic (AAWT) traffic flows for the local roads with the Proposed Development. These numbers were predicted by assuming an additional 3600 vehicles entering and leaving the Site over an 18 hour period, within Phase 1 and 2, in 2026.
- 10.88 It is not expected that the traffic would use the route as a cut through, as a bus gate has been proposed to the east of the site, to access Leigh Park. It is expected that the number of vehicles along the access site road will reduce with distance into the Site. The noise is predicted to be approximately 60dB $L_{A10-18hr}$, comparable with a noise level of 58dB $L_{Aeq-16hr}$, at the proposed hotel, approximately 30m from the road.
- 10.89 The A3(M) will be the most dominant source of noise at the hotel. As stated in earlier sections, the design and orientation of the hotel on the access road could be designed to improve the noise levels within the building from the roads.

Night Time Site Access

- 10.90 It is possible that the proposed B8 sites may accept 24hr deliveries, therefore the night time maximum noise levels have been predicted, as they are associated with sleep disturbance.

- 10.91 In order to estimate the noise from the delivery lorries, the assessment used the brown book, 'A Guide to Measurement and Prediction of the Equivalent Continuous Sound Level L_{eq} ' (1978), as a reference for the L_0 (equivalent to the L_{Amax} for our purposes). This was predicted to be 81dB, from the noisiest (4 axle) lorry at low speed, and at 7.5m distance from the source.
- 10.92 The distance from the nearest residential property to the middle of the entrance to the phase 1 and phase 2 of the B8 units was predicted using the masterplan provided. The L_{Amax} at the nearest residential properties were predicted as follows in Table 10.13;

Table 10.13 - Predicted L_{Amax} from Delivery Lorries at Night

B8 Plot, Phase	Distance to Nearest Noise Sensitive Property	Noise Attenuation over Soft Ground	Predicted L_{Amax} from Lorry at Property	Predicted L_{Amax} within Property
1	75m	23dB	58dB	43dB
2	125m	29dB	52dB	37dB

- 10.93 Therefore, where 42dB L_{Amax} is the approximate limit for sleep disturbance, it is expected that the B8 in Phase 2 will not cause sleep disturbance, and that for Phase 1 it is predicted to be just above the limit for sleep disturbance.
- 10.94 However, if the number of delivery lorries is not expected to exceed 10-15 lorries a night, the nearest residents are less likely to suffer sleep disturbance.
- 10.95 It has been assumed that few, if any, buses and other heavy vehicles will not continue past the entrance of the Phase 1 B8 to the bus gate at night.
- 10.96 The number of lorries on the access road at night may also affect the proposed hotel. In addition to the noise from the daytime traffic, the design and orientation of the hotel on the access road could be used to improve the noise levels from the lorries at night within the building.

Car Parks

- 10.97 The Proposed Development will have car-parking which serves the proposed uses. It has been assumed that the car park would be used during daytime hours.
- 10.98 Table 10.15 shows the predicted noise levels at noise-sensitive receivers adjacent to the car park. In the absence of other data, the predictions are based on 20 car movements within a typical 1 hour period using noise measurements taken on similar projects and assume no screening of noise at any receptor. The distance from the properties to the nearest plot has been estimated, these were provided in Table 10.8.
- 10.99 Based upon Atkins previous project experience the following noise emissions would be expected from various activities associated with car parks.

Table 10.14 - Typical Activities from Car Movements

Activity	Average noise level, dB $L_{Aeq,5min}$	Maximum noise level, dB L_{Amax}
Car arriving / leaving @ 3.5m	66	71
Car manoeuvring @ 3.5m	63	66
Car door close @ 3.5m	n/a	75

Table 10.15 - Predicted Noise Levels from Car Park Activities

Receptor	Nearest Plot Edge	Average Noise Level, dB $L_{Aeq,1hr}$	Maximum Noise Level, dB L_{Amax}
New School, Leigh Park	115m to plot	26	39
Closest new property, Leigh Park	65m to plot	32	45
111 Ramsdale Lane	120m to plot	25	39
2-8 Larkwhistle Walk and 1-12 Hockham Court	75m to plot	30	44
Proposed Hotel	75m to adjacent plot Distance to own car park is unknown	30	44

- 10.100 Table 10.15 shows that the resulting noise level from car park activities would be more than 10 dB below the existing background day-time noise levels in the area, which is a positive indication that complaints are unlikely.
- 10.101 If the number of car park movements was 40 or 80 per hour, the average L_{Aeq} noise level would be 3dB and 6dB higher respectively, and the levels would still be within the PPG24 NEC A band and unlikely to cause complaint.
- 10.102 The maximum noise levels are below the limits for sleep disturbance (57dB L_{Amax}), and therefore the car parks are unlikely to cause sleep disturbance with reasonable usage at night.
- 10.103 It is possible that this may be improved further by the internal layout design of the properties and the design/location of the industrial units.
- 10.104 The design of the hotel car park will need to be considered when designing the external layout of the car park.

Plant Noise

- 10.105 The noise from the plant of the buildings can be overcome by design. Noise conditions should be imposed which make sure that location and specification of the plant noise conform to BS4142 and the target criteria imposed by Havant Borough Council.

Noise from Site Units

- 10.106 At this stage the layout of the buildings and the occupants, and potential noise issues, of the buildings are unknown. However, the noise from the industrial sources can be overcome by design, and there are measures which could be taken to improve the noise levels further, including:
- Orientation of the layout the phases have already been designed such that the B8 storage units are located closer to the residential properties than the potentially noisier B1/B2 units;
 - Ensuring that the B8 buildings are located between the housing and the car park;
 - Being careful when positioning the doors and loading bays for the B8 units; they ought to be sited away from the housing rather than on the end of a block;
 - Making sure that all night time traffic to the Phase 2 B8, uses the route furthest from the housing;
 - If possible, moving the entrance routes to the B8 units further from the housing, would improve the noise from the lorry movements;

- Locating the offices of the units on the quietest facade, where possible, away from loading bays or noise machinery;
- Designing the layout of the buildings such that they do not cause noise reflections at noise sensitive properties; and
- At night the noise from the A3(M) will be quieter, and therefore it may be necessary to impose reduced operational hours, where machinery may cause night time disturbance.

10.107 Noise conditions should be imposed which make sure that location and specification of the noise conform to BS4142 and the target criteria imposed by Havant Borough Council.

Cumulative Effect

10.108 Each of the likely significant noise effects have been assessed individually. The overall noise levels from the local traffic, site traffic, and phased construction has not been assessed at this stage. The cumulative effect of these individual sources could be assessed when more data is available.

Summary

10.109 A noise assessment has been carried out to assess the likely significant effects of the Proposed Development both during construction and operation.

10.110 The assessment was undertaken in accordance with a number of key standards and guidance documents, and with reference to the measured ambient noise levels in and around the study area.

10.111 A summary of impacts and recommendations is provided below.

Construction Noise and Vibration

10.112 At the time of producing this report, a detailed construction programme was not available. Calculations based upon the likely plant and equipment to be employed during the phases of construction indicates that construction noise from individual items of plant could give rise to a significant impact at receptors especially those within 50m from road construction works. With appropriate noise mitigation measures and good working practices, it would be possible to minimise the duration and extent of significant construction noise effects. A number of generic noise control measures have been described in this report.

10.113 The construction of foundations for the new buildings may require piling. The factors which affect the levels of vibration would include the details of the pile and piling hammer or driver, the ground conditions and characteristics as well as the distance from the pile to measurement point.

10.114 An indicative assessment has shown vibration levels may be perceivable at all distances considered but are only likely to cause complaints within 40m of the works. It is unlikely that there would be any damage to surrounding buildings. It is important to note that the limit values expressed in the report for well maintained and structurally sound properties and they should be considered an absolute maximum not an allowable level.

Operational Noise from the Proposed Development

10.115 The operation of the site, including the car parks, site traffic and night time deliveries is unlikely to have a significant effect on the nearest noise sensitive properties. Where there may be potential noise impacts from the unknown usage of the units, the detailed design of the Proposed Development and conditions imposed can ensure that the nearest residents are not affected by the noise from the Site outside acceptable limits.

10.116 The noise from the A3(M), the access road, the car parks and night time deliveries is most likely to affect the proposed hotel. The design of the layout, construction and orientation of the hotel can influence the noise levels within the hotel bedrooms.

Road Traffic Noise

10.117 An increase in traffic flows by 25% or a decrease by 20% would result in a 1 dB noise change. It is expected that the additional road traffic generated by the Proposed Development would be sufficiently low volume not to affect existing road network.

Cumulative Noise Effects

10.118 When better data is available on the construction, traffic and site usage, further assessments will be required, including an assessment of the cumulative Effects.

Table 10.16 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Noise from the construction of the roads and plots could impact on noise sensitive receptors.	Appropriate noise barriers positioned close to the source of the noise could reduce the noise by 10dB. Distance between the source and receptor and position of equipment. Reducing noise at source, by fitting silencers/mufflers where possible. Keeping the equipment in good working order. Shutting down machines in intermittent use Good communication with affected residents	Temporary, direct, negative residual effect Where these measures are not possible or effective, the impact would be moderate at some properties.
Vibration from the construction of the roads and plots could impact on noise sensitive receptors.	Avoiding percussive piling within 40m of a property Good communication with affected residents	Temporary, direct, negative residual effect Where these measures are not possible or effective, the impact would be moderate at some properties
Operation		
Traffic Noise from Development	None	Neutral Impact-negligible change in traffic
Traffic Noise on Development	Design of Hotel and Offices	Neutral Impact
Night Time Deliveries	Distance and number of deliveries per night	Permanent, direct, negative effect Minor Impact
Car Park	None	Neutral Impact
Industrial and Plant Noise	Design, Layout, Noise Conditions Imposed	Permanent, direct, negative effect Minor Impact

11 Cultural Heritage

Introduction

- 11.1 This chapter provides an assessment of the likely significant effects of the Proposed Development on the historic environment and presents the proposed approach to the mitigation of those effects through a programme of works.

Scoping Response

- 11.2 Cultural Heritage issues raised by respondents to the EIA Scoping Report are summarised in Table 11.1

Table 11.1 - Scoping Response - Cultural Heritage Issues

Issue Raised	Respondent
No archaeological work required prior to the submission of an Outline Planning Application.	Dr. Hannah Fluck, Hampshire County Council, Archaeology, Strategic Environmental Delivery Group Andrew Croft, Atkins, Euston Tower, London
The archaeological evaluation should however be undertaken before any Detailed Planning Application is submitted to ensure mitigation measures can be taken into account.	
Archaeological field evaluation is not necessarily required before the detailed application for the access road is submitted concurrently with the outline application.	
Ensure impacts to the setting of the Sir George Staunton Conservation Area are considered. Ensure Archaeologists at Hants County Council are satisfied with the level of archaeological investigation.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).
Ensure that within any pre-application consultation views should be sought to include the wider public to consider value of assets paragraph 6.30 and whether any other assets are identified.	

Key Aspects of the Project

- 11.3 The Site contains no designated heritage assets and no significant known heritage assets. However, it has not been subject to past development and the construction phase of the development has the potential to disturb and degrade currently unidentified archaeological remains. To address this issue, a comprehensive programme of archaeological research will be embedded into the construction process.
- 11.4 Construction of the development will also result in changes to the local historic landscape. These are not overly significant given the limited value of that historic landscape. No significant effects on designated heritage assets outside of the Site are expected to occur as a result of the construction or operation of the scheme. The primary historic environment issues associated with Proposed Development therefore arise in the construction phase and predominantly relate to the effects of development on potential archaeological remains.

Relevant Legislation, Policies and Guidelines

- 11.5 Key relevant planning policy is contained in Planning Policy Statement 5: Planning for the Historic Environment (DCLG 2010). Within this the key policy principles are:
- Policy HE6: Information requirements for applications for consent affecting heritage assets;
 - Policy HE7: Policy principles guiding the determination of applications for consent relating to all heritage assets;
 - Policy HE8: Additional policy principle guiding the consideration of applications for consent relating to heritage assets that are not covered by policy HE 9; and
 - Policy HE12: Policy principles guiding the recording of information related to heritage assets
- 11.6 These clearly identify the need to take account of undesignated heritage assets, including archaeological remains, in the development process.
- 11.7 Fuller details of local planning policy can be found in Section 3.

Approach to Assessment

- 11.8 The Scoping Report (Reference 11.1) clearly identified that there would be no likely significant effects on the following types of designated heritage assets and their settings and therefore consideration of these could be scoped out:
- Scheduled Monuments;
 - Listed Buildings;
 - Registered Parks and Gardens;
 - Registered Battlefields; and
 - Conservation Areas.
- 11.9 Havant Borough Council's (HBC) Scoping Opinion (Reference 11.2) requested that the potential impact on the setting of the Sir George Staunton Conservation Area be assessed. This assessment is included below. The primary issue identified by the scoping report was the potential effects of the Proposed Development currently unidentified archaeological remains that may lie within the Site.
- 11.10 This chapter therefore focuses on this main issue and outlines a proposed archaeological mitigation strategy for the Proposed Development. This reflects the Hampshire County Council's Senior Archaeologist's view that pre-submission and pre-determination archaeological works are not required for the Outline Application or Detailed Application for the access road (email from Dr Hannah Fluck, dated 6th June 2011).

Baseline Conditions

Archaeological Remains

- 11.11 The Site was subject to an Archaeological Desk Based Assessment in 2002 (AOC Archaeology) (Appendix 11.1) and an archaeological field evaluation (A13 HAHBR 60050) was undertaken immediately to the south-west of the Site in 2008, the latter identified no archaeological features, finds or deposits. The Scoping Report identified no additional records on the Archaeology and Historic Buildings Record within the site or 1 km study area. The findings of the 2002 Desk Based Assessment therefore broadly stand, particularly in relation to more recent periods of activity.
- 11.12 Consultation with the Hampshire County Council's Senior Archaeologist, Dr Hannah Fluck, in February 2011 highlighted that an increasingly comprehensive picture of landscape use and

settlement activity in the area has been developed in recent years, particularly with recent discoveries at Purbrook and Waterlooville, which are within 1 km of the Site.

- 11.13 Given this situation it is clear that the absence of significant known archaeological remains on the Site should not be taken as a clear indication of absence of below ground archaeological remains and that there is some potential for as yet unknown buried archaeological remains of possible Prehistoric, Roman (HCC Senior Archaeologist per comms) and/or medieval date to exist within the Site (AOC 2002). The exact nature, scale and significance of these has not been determined.

Sir George Staunton Conservation Area

- 11.14 The Sir George Staunton Conservation Area is located to the north of Havant town centre on the west side of the B2149 (Petersfield Road). The conservation area lies to the west of the Site. The closest distance between the edge of the Site and the conservation area is c 1.2km with its core lying c. 2.5km from the Site.
- 11.15 The conservation area encompasses c. 63 ha of a once larger early to mid-19th century designed landscape. The landscape was largely designed and constructed under the instructions of Sir George Staunton in the period 1819-1859. The designed landscape is an important example of an ornamental landscaped parkland which incorporates the styles and influences of the early 19th century and in particular Sir George Staunton's association with China. The Conservation Area covers only part of the original estate, with much of it being subject to development in the mid to late 20th century. The conservation area does however encompass the historic and designed core of the estate landscape.
- 11.16 As set out in the Conservation Area Appraisal *"The Estate is split in two by the east west route of Middle Park Way, with the largest part on the north-side consisting generally of open landscape stretching northwards, including lawns, grazing areas, farmland and woodland. South of Middle Park Way, the scale of the landscape is more intimate and sub-divided into a number of distinct landscaped areas, including small gardens and lawns, an ornamental farm (Ferme Ornee) and kitchen gardens. There are a range of historical building groups, individual structures and follies spread throughout the Estate. The south west and southern boundaries of the Estate abut suburban residential areas and the local junior school".*
- In terms of its relationship with the wider area, the Conservation Area Appraisal notes the following in relation to views: "Leigh Park was always noted for its extensive views over the surrounding countryside. Some views no longer exist due to growth of trees, or surrounding housing development. However, notable views are still to be obtained from 1) a panorama from The Terrace towards the Lake and to the west over Havant Thicket; 2) of Hammond' Lands Copse from the end of the Northern Entrance Drive and the Terrace and 3) attractive vistas of High Lawn and Thicket lawn from Middle Park Way."*
- 11.17 There are no views of the Site from the estate nor are there views of the estate from the Site. All potential views are screened by intervening vegetation, built form and topography.

Identification and Assessment of Likely Effects

Archaeological Remains

- 11.18 The scope of potential effects of the Proposed Development on below-ground archaeological remains cannot be accurately determined at this time. Given the requirements of National Planning Policy in PPS5 a comprehensive programme of archaeological mitigation would need to be implemented alongside the construction phases. The following broad stages are suggested:
- 1) Preparation of Research Design for entire Site. The scale of the proposed development and longevity of the construction works coupled with the limited available knowledge regarding remains all indicate that structured Research Design would be of benefit to provide a focussed and reflexive approach to the investigation and analysis of any archaeological

remains. The Design would be prepared in full consultation with HBC and their archaeological advisor;

- 2) Archaeological Evaluation, probably including geophysical survey and trial trenching of the proposed access road and associated infrastructure (the Detailed Application). Evaluation of the first phase of infrastructure will support the identification of any concentrations of archaeological remains and also test the efficacy of different approaches in the context of the local conditions. This work would commence once the Research Design has been approved;
- 3) Detailed archaeological investigation, if required, of any significant remains identified in Stage 2. Should significant archaeological remains be identified in Stage 2 these would be excavated and recorded, probably using Strip, Map and Sample, in advance of construction works;
- 4) Review of efficacy of archaeological methods employed and updating of Research Design. Following the previous stages the work to date would be reviewed and an interim publication would be prepared. This would lead to a review and refresh of the Research Design and a re-focussing of archaeological works for the remainder of the construction phases;
- 5) Archaeological evaluation, and any required follow-on investigation / excavation for Phase 1 works;
- 6) Updating of Research Design and publication of archaeological findings following completion of Stage 5;
- 7) Archaeological evaluation, and any required follow-on investigation / excavation for Phase 2 works;
- 8) Publication of all Archaeological findings within 2 years of completion of all works on site.

11.19 The implementation of this long-term programme of archaeological mitigation would help ensure that the archaeological interest (as defined in PPS5) of any remains with the Site is addressed, recorded and disseminated. This process meets the requirements of PPS5 and would ensure that the Proposed Development would not result in substantial harm to archaeological remains. The staged mitigation process would also, if necessary, enable the Proposed Development to be designed in a responsive manner to potentially safeguard any highly significant archaeological remains that are identified.

11.20 Whilst the effects of the construction works on archaeological remains cannot be accurately predicted at this stage the proposed mitigation strategy will ensure that any effects are appropriately addressed and there would consequently be no significant adverse effects.

Sir George Staunton Conservation Area

11.21 In line with Parameter Plan 3 (Figure 4.3) the proposed development would largely consist of 2 to 3 storey structures on the elevated areas of the development site and up to 3 or 4 storey structures in the lower areas of the Site (up to 5 storeys for Hotel). Given this development profile, the distance between the Site and the conservation area and the extent of pre-existing screening it is clear that the Proposed Development will not intrude upon or alter the visual setting of the conservation area. Consequently, there will be no adverse effects.

Summary

- 11.22 The Site contains no designated heritage assets and no significant known heritage assets. As set out in the Scoping Report, there would be no effects on any designated heritage assets and their settings. This was acknowledged in HBC's Scoping Opinion although they requested that potential impacts on the setting of the Sir George Staunton Conservation Area should be assessed. Further assessment of this issue has been undertaken and no adverse effects have been identified.
- 11.23 The main issue identified is the likely significant effects of the Proposed Development on currently unidentified archaeological remains that may lie within the Site. This reflects the fact that the Site has not been subject to past development and construction phase of the development therefore has the potential to disturb and degrade currently unidentified archaeological remains. To address this issue, a comprehensive programme of archaeological research has been recommended.

Table 11.2 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Currently unknown archaeological remains within the Site	Impacts cannot be determined and consequently an archaeological research programme will be embedded into the construction process	The archaeological research programme will ensure that the archaeological interest of any remains is captured and disseminated. This process meets the requirements of PPS5 and the development would therefore not result in substantial harm to archaeological remains. Whilst the effects of the construction works on archaeological remains cannot be accurately predicted at this stage the archaeological research programme will ensure that any impacts are appropriately addressed and there would consequently be no significant adverse effects
Operation		
Sir George Staunton Conservation Area	The scheme would not affect the visual setting of the conservation area	No residual effects

References

- 11.1 EIA Scoping Report (March 2011) in Appendix 2.1.
- 11.2 HBC EIA Scoping Opinion (April 2011) in Appendix 2.2.

12 Ground Conditions and Contaminated Land

Introduction

- 12.1 This section assesses the likely significant effects of the Proposed Development on the potential for land contamination. Ground conditions and geology are covered within Chapter 6, Land Use, and effects on groundwater are covered under Chapter 12, Water Resources. Previous detailed considerations of the ground conditions have been undertaken on land within the application boundary as part of a baseline study produced in 2002 (Reference 12.1).
- 12.2 This assessment is also based upon publicly available information, a site visit and consultation with the British Geological Survey, Environment Agency, and Havant Borough Council. All existing information was then gathered and subsequently used to inform a Feasibility Study for the current scheme which was produced in September 2010 (Reference 12.2).
- 12.3 The results of these previous assessments, and the findings of a limited ground investigation, will be used to inform the assessment of the potential for land contamination.

Scoping Response

- 12.4 Ground conditions and contaminated land issues raised by respondents to the EIA Scoping Report are summarised in Table 12.1.

Table 12.1 - Scoping Response - Ground Conditions and Contaminated Land Issues

Issue Raised	Respondent
It is agreed that the proposed scope of work for the ES is appropriate.	Jonathan Driver, Environmental Control Officer, Havant Borough Council (comment as 23 March 2011 to the original Scoping Report).
The land is of low sensitivity in terms of the development as a receptor for the contamination issues, and there are no known potential sources other than those identified in the scoping report.	
Consideration to be given as to whether specialist study of 2003 is sufficient to identify soil grades across site. Consideration should be given to likely volume and grades of soil which will be moved or removed during construction.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).
Advised that the type of further investigation is agreed with the Council's Environmental Health Officer in advance. Further cross referencing required with other chapters.	
In the construction phase, measures to reduce risks of a pollution event or its mitigation should be explained.	

Key Aspects of the Project

- 12.5 The Site is an undeveloped 43 ha area that comprises agricultural fields, hedgerows and blocks of woodland. It is understood that an area of the site has been used for the disposal of excess spoil from the construction of the A3(M), the 'landfill' which has the potential to be contaminated. Development on the site will cause disturbance of this site which could impact on the construction of the development. The role of this chapter is to assess these effects and their significance.

Approach to Assessment

- 12.6 The assessment follows the methodology outlined in the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 2, Part 6 'Guidelines for a Stage 2 Environmental Assessment'. This provides a comprehensive framework for the assessment of impacts on ground conditions and contaminated land of infrastructure developments, such as the Dunsbury Hill Farm development.
- 12.7 The range of ground conditions and contaminated land topics that currently require consideration under DMRB Volume 11, Section 2, Part 6 are as follows:
- Impacts on geology and geomorphology;
 - Impacts on soils;
 - Contaminated Land.
- 12.8 The impacts on geology, geomorphology and soils is considered in the Land Use chapter. Consequently this chapter is concerned solely with Contaminated Land.
- 12.9 The study area for a geological impact assessment is typically defined by the extent of the geology that the scheme construction and associated works would directly change. In this instance, the study area comprises the land within the Site plus any land immediately beyond the boundary that is directly linked to the land within. All such land lies within the boundary of land owned by PCC.
- 12.10 The assessment is based on desk study and on investigation. Desk study included plans, drawings and proposed mitigation measures; national and local policy guidance; and published geological maps and data. Consultation was undertaken with site landowners PCC.
- 12.11 A nationally recognised set of standard assessment criteria for effects on ground conditions and contaminated land does not exist. A bespoke set of criteria has therefore been used for this assessment. This has been developed in the light of relevant European, national, regional and local policies and guidance.
- 12.12 The significance criteria address both magnitude of impact and sensitivity of the resource and have been derived from consideration of the characteristics of the impact and the receptor, as follows:
- Type of impact - direct or indirect;
 - Nature of impact - positive or negative or neutral;
 - Duration of impact - short or long term, reversible or not;
 - Frequency of impact - continuous or intermittent, changing with time or constant; and
 - Geographical context - international, national, regional or local.

Table 12.2 - Significance of Effect on Contaminated Land

Effect	Criteria
Large	Widespread occurrence of contaminated land with the potential to cause harm to people or the environment, and which would require treatment during the construction period, and with potential to significantly extend the required construction programme.
Moderate	More frequent hotspots or more widespread occurrence of contaminated land with the potential to cause harm to people or the environment, and which would require treatment during the construction period, but would not have a large impact on the overall construction programme.
Slight	Some hotspots of contaminated land may require treatment during the construction period, but would be unlikely to impact on the overall construction programme.
Neutral	No change, or no contaminated land present to be disturbed.

Baseline Conditions

- 12.13 An intrusive investigation was undertaken between the 6th and 10th of June 2011 and comprised the construction of six cable percussion boreholes, and the excavation of nine machine-dug trial pits and four hand dug pits.
- 12.14 The geology of the site was found to comprise ploughed topsoil with localised deposits of Made Ground underlain by Head Deposits. The Head Deposits are further underlain by Bognor Sand Member and London Clay Formation. The London Clay is present across the Site, and outcrops towards the south west corner, where the upper layers have weathered. The remainder of the Site has Bognor Sand overlying the London Clay. No areas of contaminated land were found, although an area of infilled ground dating from the time of construction of the A3(M) is known from desk study sources.
- 12.15 The baseline is unlikely to change over time, except that any pockets of contaminated land found during construction will be treated at the time and hence pose no further risk going forward.
- 12.16 The affects on geology and groundwater are assessed under the Land Use and Water Resources chapters respectively. This chapter will, therefore, be confined to assessing impacts related to contaminated land.
- 12.17 The desk study exercise identified a small area around the now demolished Dunsbury Hill Farm buildings as being the recipient of inert spoil from the construction of the A3(M). Made ground associated with the construction of the motorway is present in the extreme south western part of the Site.
- 12.18 There is no suggestion that any of this ground is contaminated such as to cause harm to the environment or human receptors, either in the short term during construction, or in the longer term once the business park is in operation. The recent preliminary ground investigation found no evidence of contaminated land. However, it was relatively limited in scope and therefore cannot be considered to prove its absence. The effects on the Proposed Development from contaminated land is therefore considered to be **slight adverse** in the short term, and **neutral** in the long term.

Summary

- 12.19 This chapter is concerned with contaminated land. No contaminated land was found during the recent limited intrusive investigation. There is some suggestion from the desk study that contaminated land may be present on the Site as a result of the infilling of ground with inert waste from the A3(M) construction works. This has been interpreted to mean excess spoil not required for the motorway earthworks. The presence of significant quantities of substances harmful to environmental or human receptors is expected to be unlikely. The effect on the scheme of any contaminated land is therefore assessed as neutral in the long term.

Table 12.3 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Small pockets of contaminated land may be present within the Site.	Expected contamination, if any, is expected to be easily treated/removed during the construction period.	Slight/Minor adverse
Operation		
Small pockets of contaminated land may be present within the development area.	Will be treated/ removed during the construction period.	Neutral

References

- 12.1 Dunsbury Farm, Baseline Report into Ground Conditions, Campbell Reith Hill, 2002.
- 12.2 Dunsbury Hill Farm, Stage 1: Feasibility Study, 2010, PUSH, PCC and HBC, Atkins.

13 Water Resources and Flood Risk

Introduction

- 13.1 This section assesses the likely significant effects of the Proposed Development on the water environment. Previous detailed considerations of effects of development on water environment have been undertaken on land within the Site as part of a report and associated technical appendices produced in January 2003 (Reference 13.1).
- 13.2 This assessment is also based upon publicly available information, a site visit and consultation with the Environment Agency, Havant Borough Council, Portsmouth Water and Southern Water. All existing information was then gathered and subsequently used to inform a Feasibility Study for the current scheme which was produced in September 2010 (Reference 13.2).
- 13.3 The results of those previous assessments are used to inform this assessment of the water environment.

Scoping Response

- 13.4 Water resources and flood risk issues raised by respondents to the EIA Scoping Report are summarised in Table 13.1.

Table 13.1 - Scoping Response - Water Resources and Flood Risk Issues

Issue Raised	Respondent
With regard to surface water quality, it is stressed that the development should not cause any deterioration in the current status of the Hermitage Stream and if there are opportunities to improve the status that these are undertaken.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).
Strongly recommended that it is clearly demonstrated that surface water drainage system would have adequate capacity to accommodate a stated maximum level of development and built coverage.	
Further details are required with regard to river and surrounding land ownership.	
The ES needs to identify sustainability measures to clearly state the level of water efficiency to be achieved in order to limit the impact of this development on Budds Farm WWTW.	
Strongly recommended that potential cumulative impact of the allocated development site for a reservoir at Havant Thicket are included.	
Strongly recommended that a check is done to ensure all licenses are obtained and whether any unauthorised water abstractions are known to exist.	
Although it has been estimated that the works can accept the housing development proposed in the catchment, the ES needs to identify sustainability measures to clearly state the level of water efficiency to be achieved in order to limit the impact of this development on Budds Farm WWTW.	Helen Tier, Planning Liaison Officer (South Downs Area), Environment Agency (comment as at 22 March 2011 to the original Scoping Report).

13.5

Key Aspects of the Project

- 13.6 As described in the 'Site Description and Context' chapter, there will be a detailed focus on assessment of impact from a link road across the Site and consideration of outline development for the rest of the Site.
- 13.7 The key aspects of the water environment assessment relate to mitigation and enhancement of the impacts to the water environment. In particular this would include:
- Determining key receptors through a baseline assessment;
 - Ensuring no detrimental impact on water quality or attenuation;
 - Selection of appropriate Sustainable Drainage Systems (SUDS);
 - Restoration of a section of Hermitage Stream; and
 - Consideration of water efficiency measures.
- 13.8 The key mitigation measures that have been incorporated into the scheme are SUDS in the form of swales and ponds, proposed both for the link road and the outline design. An additional benefit to the scheme is the restoration of a section of Hermitage Stream.

Relevant Legislation, Policies and Guidelines

- 13.9 Key planning documents and guidance relating to the water environment are noted in Section 3 and summarised here, including:
- HA45/09 (Road Drainage and the Water Environment) (Reference 13.3);
 - HA103/06 (Vegetative Treatment Systems) (Reference 13.4);
 - PPS1: Delivering Sustainable Development (Reference 13.5);
 - PPS9 : Biodiversity and Geological Conservation (Reference 13.5);
 - PPS23 : Planning and Pollution Control (Reference 13.5);
 - PPS25 : Development and Flood Risk (guides assessment of flood risk and promotes SUDS) (Reference 13.5);
 - South East Plan, Cross Cutting Policies and Natural resource management policies (Reference 13.6);
 - Policy CS15 [Havant Borough Core strategy] (Reference 13.7);
 - BREEAM Offices assessment (Reference 13.8);
 - CIRIA c697 The SUDS Manual (hereafter known as "the SUDS manual"). (Reference 13.9);
 - Water Framework Directive (2000/60/EC) (Reference 13.10);
 - South East River Basin Management Plan (Reference 13.11);
 - PUSH Strategic Flood Risk Assessment (Reference 13.12); and
 - Water Resources Act, 1991 (Reference 13.13).

Approach to Assessment

- 13.10 The assessment will be undertaken with reference to current best practice and in particular the Design Manual for Roads and Bridges (DMRB), WebTAG (Reference 13.14) and CIRIA guidance, including the SUDS Manual.
- 13.11 There will be separate consideration of a detailed road assessment and an outline development assessment for both construction and operation.

- 13.12 For the detailed assessment of the link road, DMRB guidance from HD45/09 (Reference 13.3) and HA103/06 (Reference 13.4) as well as the SUDS Manual has been considered to determine a level of scheme design to prevent any adverse affects on the water environment. Where particular terminology of the DMRB conflicts with the methodology outlined in Chapter 2 of this report, this will be explained within the text.
- 13.13 Assessment of the effects of the outline development on the water environment will be undertaken by applying the method outlined in the Chapter 2, with reference to a checklist used at the Scoping stage. This is based on unit 3.3.11 “the water objective” of the WebTAG process developed by the Department for Transport. Ecological impacts are fully considered within Chapter 15, but will also be considered within this chapter where they relate to the aquatic environment.

Baseline Conditions

- 13.14 An updated desk study was undertaken by Atkins in 2010 as part of a feasibility study (Reference 13.2). The baseline conditions of the Site have been identified through previous reports (Reference 13.1), a previous site visit undertaken on the 20th July 2010, data provided directly through consultees and via websites, including the Environment Agency, British Geological Survey, MAGIC and Natural England (Reference 13.15).
- 13.15 Table 13.2 shows receptors that were scoped out at the Scoping stage and a reason for their removal. These receptors will not be considered further in this baseline assessment.

Table 13.2 - Water Attributes Scoped Out at Scoping Stage

Attribute	Measure	Reason for Scoping Out
River Drinking water supply intakes/private abstractions	Classification, defined within the Surface Waters (abstraction for Drinking Water) (Classification) Regulations 1996 no, 3001. Data from EA Website and Local council	No drinking water abstractions from watercourses.
		No SPZ affected by Scheme
		No private abstractions (<20m) confirmed by Havant Borough Council
		No further requirement
Riverside access	Presence/absence	None known
Navigation	Presence/absence within 2km	None known
Presence/absence of designated site	Designation	Excluded due to distance and most probable mechanism of impact (WQ coinciding with significant pollution incident)
Landscape quality	Presence/ Absence of AONB	None present
Groundwater PWS abstractions	Location and volume of abstraction	None within 1km of intrusive works
Groundwater other abstractions	Location and volume of abstraction	No abstraction within 1km of site

Current Drainage and Water Conditions

- 13.16 The Site has a maximum elevation of 45m above ordnance datum (AOD) to the north of the Site, generally sloping to the south and the east. The slope to the south of the site is around 1 in 30. The lowest point on the Site is Hermitage Stream at 15mAOD.

- 13.17 The water environment of Dunsbury Hill is dominated by Hermitage Stream which runs from Waterlooville located to the west and south of the Site and then into Leigh Park to the south east of the Site. A section of Hermitage Stream over 100 metres in length is channelized running eastwards from the A3(M) motorway to the west of the Site.
- 13.18 A tributary of Hermitage Stream runs to the east of the Site, referred to as the 'Park Lane Stream' in previous investigations. The Park Lane Stream is culverted outside of the Site boundary as it flows away from the Site before it reaches an area of housing prior to joining Hermitage Stream.
- 13.19 There are a number of other drains and ditches on Site that for the purposes of this assessment have been considered to be in connectivity with Hermitage Stream.
- 13.20 There are two small ponds recorded within the land ownership of PCC; one within the grounds of the farmhouse buildings of Dunsbury Hill Farm and the second in a woodland area to the east.

Water Infrastructure

- 13.21 There are two existing foul sewers crossing the southern part of the Site. The Environment Agency has indicated that sewers in this area flow to Budd's Farm wastewater treatment works (Reference 13.2).
- 13.22 Foul water provision is considered to be of a low importance to the water environment.
- 13.23 Portsmouth Water has confirmed that there would be sufficient supply of water to meet the demands of the Proposed Development, given the information available in local development plans (Reference 13.2).
- 13.24 Clean water provision is considered to be a low importance to the water environment.
- 13.25 In each case, it will be the responsibility of the developer to conduct standard applications and provide all connections to the existing infrastructure.

Surface Water Quality

- 13.26 The South East River Basin Management Plan (Reference 13.16) has identified that Hermitage Stream waterbody ID number: GB107042016370 is classified as a 'Heavily Modified' waterbody under the Water Framework Directive. This means that the requirement is for the waterbody to reach 'Good Ecological Potential' rather than 'Good Ecological Status'. The River Basin Management Plan has classified the current overall potential of the river as 'Moderate', the main reasons being the Drinking Water, Flood Protection, Navigation and Water Storage. The target is to reach Good Ecological Potential and Good Chemical Status by 2027. It has also been determined that it would be disproportionately expensive and technically infeasible to improve the water quality to Good status by 2015.
- 13.27 The overall physio-chemical water quality Water Framework Directive classification for this watercourse is moderate.
- 13.28 With regard to water quality, Hermitage Stream and Park Lane Stream are both of medium importance due to a chemical grade of B downstream of Leigh Park on Hermitage Stream.

Groundwater Quality

- 13.29 The majority of the Site is underlain by London Clay with small areas of Bognor Sands as shown on British Geological Survey Sheet 316. The London Clay is negligibly permeable and the Bognor Sands are variably permeable. The Bognor Sands are known to be 5-10m thick across the sites where they occur. Details of the site geology are set out in the Chapter 12 (Ground Conditions and Contamination).
- 13.30 There are secondary undifferentiated aquifers associated with Hermitage Stream and Park Lane Stream to the east of the Site. These aquifers are a combination of minor and non-aquifer and will only yield small volumes of water. There are secondary aquifers noted at the Site which could

provide local supply or provide base flow to watercourses. Historical maps show little change in 150 years and little activity that might contaminate groundwaters (Reference 13.1).

- 13.31 Groundwater quality at this Site is considered to be of low importance.

Abstractions and Discharges

- 13.32 There is no groundwater abstraction Source Protection Zone located on the Site. The nearest Zone is located over 500m to the north of the site. Surface water gradients flow away from this Source Protection Zone.
- 13.33 There are no groundwater abstraction licences within the site or within a 1km radius.
- 13.34 HBC has confirmed there are no private abstractions within or downstream of the Site.
- 13.35 There are two consents to discharge with a 1km radius of the Site. One of the two discharges is upstream of the Site near to Hermitage Stream. No further information is known at this stage.
- 13.36 Abstractions at this Site are considered to be of low importance.
- 13.37 Existing discharges at this Site are considered to be of low importance.

Flood Risk - General

- 13.38 Flood risk is covered in more detail within the Flood Risk Assessment (FRA) which accompanies the application and is summarised here.

Flood Risk - Fluvial and Modelling

- 13.39 Previous investigations have found that most surface water in the catchment flows into Hermitage Stream and the Park Lane Stream (Reference 13.1). The Environment Agency website highlights the outline of the 1 in 100 and 1 in 1000 year flood events, which appear to be mostly outside the Site boundaries. There are no known flooding problems from Hermitage Stream in the Site. Upstream of the culverted section of the Park Lane Stream is a flood storage area known as The Warren. This has been developed to help alleviate known flooding problems downstream of the Park Lane Stream. The Proposed Development and main access road will be in Flood Zone 1 and so fluvial flood risk will not be considered further in this report.
- 13.40 A section of Hermitage Stream to the west of the Site is channelized. Proposed alterations to the profile of the channel to allow restoration of the stream and its subsequent effect on flood risk, including consideration of bridging across this section of Hermitage Stream, required further modelling to be undertaken. This is presented in the FRA and summarised later in this chapter.
- 13.41 Surface water fluvial flood risk is considered to be of low importance due to no potential for increased fluvial flooding of residential areas downstream in Leigh Park.

Flood Risk - Pluvial

- 13.42 The Partnership for Urban South Hampshire Strategic Flood Risk Assessment (Reference 13.12) indicates that the majority of the Site has a moderate potential for pluvial flood risk. Any increase in impermeable area across the Site would increase run-off towards Park Lane Stream and Hermitage Stream and may increase flood risk downstream.
- 13.43 Pluvial Flood risk is considered to be of medium importance.

Flood Risk - Groundwater

- 13.44 Site investigations, including trial pits and boreholes, completed in early 2011 allowed spot checks of water levels. The only water strike recorded was at BH102 in which water rose to a depth of 3.15 m below ground level (Reference 13.17). The presence of London Clay would suggest minimal groundwater recharge or minimal groundwater permeability from the site (Reference 13.1).
- 13.45 Groundwater flood risk is considered to be of low importance.

Recreation

- 13.46 There is no known recreational use of the water receptors on this Site. A site visit undertaken on the 6th May 2011 concluded that the flow of water in both Hermitage Stream and Park Lane Stream would not be sufficient to provide recreational angling.
- 13.47 Following the findings of a recent site visit, existing recreational use of the Site is considered to be so minimal it will not be considered further in this report.

Aquatic Ecology

- 13.48 Aquatic ecological resources of relevance to the Proposed Development include two perennial stream systems located adjacent to the Site boundary, namely Hermitage Stream and Park Lane Stream. Hermitage Stream is classified by the Environment Agency as Main River to its source. The Park Lane Stream is Main River to Warren Dam. The Park Lane Stream is, therefore, not Main River along its boundary with the Scheme to the north-east of the Site.
- 13.49 Neither stream carries a statutory designation, although Hermitage Stream flows through, and adjacent to, three Sites of Importance to Nature Conservation adjacent to the Site, namely Beechwood East, Cheery Tree Row and Neville's Park Areas 2 and 3. Further details are provided in the Ecology chapter (Chapter 15).
- 13.50 Water Framework Directive assessments undertaken by the Environment Agency define the Hermitage Stream as a Heavily Modified Water Body due to channel modifications for flood defence purposes and urbanisation of the catchment. A fish and aquatic macroinvertebrate assessment undertaken for Water Framework Directive assessment identifies both elements as being "moderate" status (Reference 13.8). Both of these ecological elements are measured by the Environment Agency at locations downstream of the Site.
- 13.51 A Water Framework Directive assessment has not been undertaken for Park Lane Stream although it falls within the assessment catchment boundary of Hermitage Stream.

Stream Habitat Quality and Geomorphology

- 13.52 Additional aquatic ecological and stream habitat investigation was undertaken by Atkins ecologists in May 2011 in support of this EIA, focusing directly on stream sections bordering the Site boundary. These sections were investigated due to the absence of baseline ecological data, proposals for restoration, and their proximity to the Site boundary increasing vulnerability to the Proposed Development. The details of these surveys including sampling methodologies, species lists, habitat details, photographic plates and location of survey sites are reported in Appendix 13.1 in Volume 3 of this ES.
- 13.53 Aquatic macroinvertebrate surveys of three sites on Hermitage Stream and Park Lane Stream were undertaken and are shown on Figure 1.1 in Appendix 13.1.
- HS01 Concrete lined channel downstream of A3(M) road crossing;
 - HS02 Soft banked straightened channel section below concrete section;
 - HS03 Soft banked "natural" channel section downstream of HS02; and
 - PL01 Park Lane Stream adjacent to eastern Site boundary, not Main River.
- 13.54 Aquatic macroinvertebrates were sampled using standard kick sampling methodologies (Reference 13.18) and an assessment of macrophyte composition and habitat quality was undertaken. These data are reported in Appendix 13.1.
- 13.55 Review of these data identify both streams as exhibiting a depauperate macroinvertebrate community with taxon community richness be limited to a total of 15 taxa in the Hermitage Stream (aggregate value from all three samples) and 10 taxa at the single sampling site in the Park Lane Stream.

- 13.56 The Hermitage Stream site data indicates the importance of habitat quality in determining macroinvertebrate community structure at a local scale. In increasing order of taxon richness; the habitat poor concrete lined channel (HS01) supported the lowest number of taxa (5 taxa); the straightened “natural bank” section (HS02) through the woodland (9 taxa); the complex sinuous woodland section (HS03) with varying geomorphology (12 taxa).
- 13.57 The species poor community structure is reflected in the Biological Monitoring Working Party scores obtained at each sampling site on the Hermitage Stream (Biological Monitoring Working Party range = 45 to 18) and the resultant low Average Score Per Taxon scores (Average Score Per Taxon range 3.6 to 4.5) indicate a system impacted by poor biological water quality. This is further reflected by the absence of stonefly nymphs and poor representation by groups such as the mayfly and caddis fly. However, the presence of low numbers of pollution intolerant taxa in the samples obtained from the Hermitage Stream e.g. larvae of the caddis fly *Mystacides* sp. and damselfly nymphs belonging to the *Calopterygidae* family indicate that poor water quality is a sporadic event and additional factors also account for the low community richness observed, such as:
- Limited macroinvertebrate habitat availability due to small stream size combined with heavy shading resulting in an absence of aquatic macrophytes and associated macroinvertebrate taxa. This is a characteristic of most wooded headwater catchments although the range of taxa recorded in the Hermitage Stream is considered to be relatively low and the system vulnerable to species loss due to the isolated nature of the system.
 - Habitat severance and degradation resulting from channel modifications (culverting and straightening) and poor connectivity throughout system. This will act to interrupt and limit natural colonisation in the system and potentially make them vulnerable to species loss.
 - Over abundance of competitive species such as *Gammarus pulex* which may be favoured by predominant water quality.
 - High fine sediment load shown to be present within the gravel and pebble bed substrate interstices acts to limit stream bed habitat quality to a wide range of macroinvertebrate fauna.
- 13.58 Macroinvertebrate sampling conducted on the Park Lane Stream also showed the communities of this system to exhibit low species richness (10 taxa) and concomitant low Biological Monitoring Working Party and Average Score Per Taxon values indicating that it too is impacted by poor biological water quality.
- 13.59 Aquatic macroinvertebrate sampling identified the presence of fish in the Hermitage Stream (fish are coincidental captures during macroinvertebrate sampling of small stream). *Cottus gobio* (Bullhead) were recorded in both the concrete and soft banked channel sections and the presence of juvenile fish indicated local recruitment of this species.
- 13.60 Bullhead are a European - Annex 2 non-priority species (Reference 13.19), although are not considered as a Priority Species under the UK Biodiversity Action Plan. No fish were observed or recorded in the Park Lane Stream and neither stream is considered to provide any angling value at the proposed Scheme site.
- 13.61 Data searches and sampling did not indicate the presence of any notable / protected macroinvertebrate species e.g. white-clawed crayfish (*Austropotamobius pallipes*) and no known populations of protected macroinvertebrates are reported for either Hermitage Stream or Park Lane Stream.
- 13.62 Due to the impacts of riparian shading there is limited aquatic and marginal macrophyte value in Hermitage Stream and Park Lane Stream adjacent to and immediately downstream of the site boundary. Marginal species recorded include mostly shade tolerant sedges and bryophytes and aquatic macrophyte species were absent at each of the macroinvertebrate survey sites. Of note is

the presence of Himalayan balsam (*Impatiens glandulifera*), an invasive species, on the banks of Hermitage Stream.

- 13.63 Macroinvertebrate sampling conducted on Hermitage Stream and Park Lane Stream have shown both systems to support a depauperate macroinvertebrate community exhibiting low species richness and a high proportion of pollution tolerant species and they are therefore not considered to be vulnerable to physico-chemical changes that may arise from the Proposed Development.
- 13.64 The presence of juvenile and adult bullhead in Hermitage Stream indicates the suitability of the Site for recruitment of this species and it is as a result considered to be of importance at a local scale for this species. These populations are considered to be vulnerable to any long term changes in flow and sediment character which may facilitate excessive accumulations of silts and clays within the stream bed substrates.

Stream Geomorphology

- 13.65 An appraisal of the stream habitat quality (diversity of hydromorphological features supported) was undertaken in May 2011 (details are reported in Appendix 13.1). Common to both systems is the presence of clay banks and evidence of on-going bank erosion, sediment transport and a flashy response to rainfall events. At the time of survey in May 2011, flow velocities were low, estimated at <10cm sec-1 and water clarity good. The following was identified for each stream:

Hermitage Stream

- 13.66 Concrete channel: This 200m section of concrete lined channel to the south of the A3 (M) culvert exhibits very low habitat diversity. The concrete channel contains a series of weirs designed to act as velocity breaks. These are currently ineffective as velocity breaks due to coarse and fine sediment accretion between the weir sections to weir invert level. Sediment accumulation within the concrete lined channel indicates that Hermitage Stream within, and adjacent to, the Site is in sediment transport zone.
- Soft bank (straightened): Immediately downstream of the concrete lined channel is soft banked, tree lined channel which has been realigned along a straight course for approximately 85m. The bed is composed predominantly of pebble sized substrate and there is little variation in bed level resulting in a homogenous channel form. Channel complexity increases where roots from mature riparian tree protrude into the channel. The channel is slightly incised and has low vertical clay banks indicating that they are subject to on-going erosion and sediment transport. Banks are, however, relatively stable as a result of the presence of riparian trees and associated root binding.
 - Soft banked (natural): Downstream of the straightened channel, the channel form becomes more characteristic of a low order wooded stream section with an occasional tortuous planform between mature tree stands. The clay banks are high and often vertical indicating that they are subject to on-going erosion with rapid removal of collapsed bank material occurring within bayed areas. Gravel bars and deep alternate within the channel and the bed sediment is dominated by pebble and gravel substrates.

Park Lane Stream

- Adjacent to the eastern boundary of the Site the Park Lane Stream exhibits a tortuous planform with deep pools and shallower gravel sections. Of particular note is the presence of numerous large woody debris jams which act to provide a diverse set hydromorphological features. Bed substrates in faster flowing sections are dominated by pebble and gravel although within the bed interstices a high proportion of fine sediment was evident.

- 13.67 In summary the environmental value or importance of both the Hermitage Stream's and Park Lane Stream's aquatic ecology and geomorphology within the reaches likely to be affected by the Proposed Development are considered to be medium. This is due only in part to their intrinsic ecological value, more important is the rarity of these habitats at a local scale and the limited potential for substitution or replacement following disturbance. They are considered vulnerable to species loss due to the high level of habitat severance within the catchment.

Identification and Assessment of Likely Significant Effects

- 13.68 The identification and assessment of likely effects will be considered for the detailed road design and the outline Masterplan design separately. For both the detailed road design and the outline Masterplan, likely effects during construction and operation will be considered. A summary of the likely effects for the detailed road scheme during operation and the outline masterplan during operation are contained within Tables 13.9 to 13.11 and the summary text that accompanies them.
- 13.69 An indicative drainage layout for both the detailed road design and Indicative Masterplan design are shown in Figure 13.1.

Detailed Road Design Assessment

- 13.70 The Assessment of detailed road design will be considered using guidance from the Highways Agency's Design Manual for Roads and Bridges (Reference 13.3/Reference 13.4) and The SUDS Manual (Reference 13.9). The Road Drainage and the Water Environment assessment from the Design Manual for Roads and Bridges is a three part process identifying the importance of a water attribute, the magnitude of impact the scheme may have on that attribute during construction and operation, and the significance of effects of the Proposed Development during operation. A similar method will be applied to the road scheme here using terminology consistent with the rest of this planning application. A summary of the likely significant effects of the detailed road design can be found below.
- 13.71 There are two key types of risk to be considered from a new road development – pollution and flood risk. Pollution from road drainage can arise from a variety of sources including: collisions, general vehicle and road degradation, incomplete fuel combustion, leaks of oil, fuel or other pollutants, fires and atmospheric deposition. Flood risk could either be a result of development due to new impermeable area of a road increasing the rate of surface water run-off and building in the floodplain or there could be a risk of flooding to the road itself due to water environment attributes such as rivers or groundwater.
- 13.72 The proposed design of the road is shown in Figure 4.5. The road development will be a new development on Greenfield land and will link in to Hulbert Road to the west of the Site with a bus gate restricting traffic flow to Woolston Road on the east of the Site.
- 13.73 Assessment of potential significance of effects of the road development are summarised in Table 13.10.

Construction

- 13.74 During construction of new roads, mobilisation of suspended solids is a key concern. At this Site the greatest concern would be mobilisation of suspended solids into Hermitage Stream and the potential for deterioration in water quality and resultant effects on ecological receptors. This could occur during bridging of the stream or during creation of any embankments in close proximity to the stream. Further guidance is available in CIRIA c648 (Reference 13.20) to help direct prevention of sediment mobilisation. Key mitigation should include:
- Development of a sediment erosion management plan (pre construction);
 - The use of sediment nets between the road and watercourses including Hermitage Stream in particular, Park Lane Stream and on-site drains; and
 - Regular sweeping of surfaces to restrict wind blow sediment.
- 13.75 Spillages will also be a key consideration during construction. Fuel stores and refuelling areas should be clearly identified and bunded following best practise guidance.
- 13.76 Having considered the application of best practise mitigation that would be applied during construction of this road scheme, the impact of pollution during construction of the road is considered to be a **temporary adverse effect of neutral significance**.
- 13.77 Management of flooding during construction is also considered as part of CIRIA c648 guidance (Reference 13.20). There are well defined extreme flood outlines of Hermitage Stream as shown in Figure 1 of the Flood Risk Assessment. Where possible, neither material nor work should be undertaken within this floodplain. Where any work in the floodplain is proposed the Environment Agency should be consulted prior to mobilisation. Surface water flooding over newly created impermeable areas or temporary impermeable areas should be attenuated using best practise in the DMRB and CIRIA c648. The operational attenuation systems should be constructed early in the construction process to provide drainage mitigation during construction. Generic information on groundwater level suggests no historic groundwater flooding on the Site but a watching brief should be maintained. Ground Investigations should be undertaken prior to construction to confirm ground water levels on the advice of a specialist so that vulnerable areas can be targeted best.
- 13.78 Having considered the best practise mitigation that would be provided during construction for this scheme, the impact of flood risk during construction is a **temporary adverse effect of neutral significance**.
- 13.79 Provision of working facilities at this Site may require connection to existing mains or foul sewers. The developer will be responsible for ensuring consultation will be undertaken and any temporary licences are submitted before connection. Where this is not possible, temporary facilities must be provided and it is assumed wastewater will be disposed of at an appropriate processing facility.
- 13.80 It is considered there will be a **temporary adverse effect of neutral significance** related to water infrastructure on this Site during construction.
- 13.81 Any permission for abstracting water for use on the Site during construction or dewatering of aquifers should be obtained from the Environment Agency. Should a temporary discharge be required, the Environment Agency should be consulted.
- 13.82 It is considered there will be a **temporary adverse effect of neutral significance** on abstraction and discharge during construction.
- 13.83 It has been assumed for the purpose of this assessment that the construction of the road will occur at the same time as the restoration of a section of Hermitage Stream. The restoration will result in the naturalisation of approximately 100m of the currently concrete lined channel to south of the A3 (M) road crossing. The effects of the restoration process are considered in the sections that follow.

13.84 The design intent, which forms the basis of the assessment of effects relating to the restoration of the Hermitage Stream, is as follows:

- The restored section will replace the downstream 100m of concrete lined channel. Realignment work required for the restoration will footprint to the true left hand bank due to topographic and road infrastructure requirements. This area is predominantly open field with limited mature trees hence reduces the likelihood of ecological impact on terrestrial receptors. Consultation with relevant authorities regarding potential encroachment into Cherry Tree Row Site of Importance for Nature Conservation is to be undertaken;
- The restored section will be designed as a two-stage channel so that ecologically beneficial flows are maintained during low flow periods;
- Restoration works will not act to reduce channel capacity at the restoration site location and overall storage will be increased through provision of a longer channel, i.e. more sinuous planform over the same straight line distance;
- Restoration will provide a “natural” soft banked channel following its passage under the required road bridge crossing with appropriate sinuosity for the environmental setting and gradient on Site;
- Phasing of restoration construction works will ensure that the new restored channel is excavated in the dry and flow diverted upon completion of the restored channel cut. This will remove any risk of impact on Hermitage Stream downstream of the works through pathways such as fine sediment propagation;
- It is currently proposed that spoil generated as a result of the new channel cut will be disposed of on site in the concrete lined channel to reduce waste generation on site;
- Consideration should be given to remove accreted sediment between the weirs in the concrete channel for habitat provision in the new channel. Also, small enhancement works in the straightened section downstream of the existing concrete channel, through placement of large woody debris, should be considered, to improve habitat and flow and sediment diversity;
- Appropriate consent from the Environment Agency will be required for fish removal from the concrete lined channel prior to diversion of flow to the restored length. The need has been identified through the capture of bullhead during macroinvertebrates sampling undertaken in May 2011;
- The addition of cobble substrate and large woody debris within, and downstream of, the restored reach to provide more optimal habitat for bullhead and improved habitat diversity should be considered;
- The riparian zone is to be enhanced through native wetland tree planting e.g. Alder (*Alnus glutinosa*) and installation of appropriate bank side vegetation; and
- It is also assumed that provision will be made for monitoring the restored reach to evaluate ecological response to the restoration works.

13.85 During the road construction and Hermitage Stream restoration phase, potential impacts on the aquatic ecological and physical habitat quality of Hermitage Stream relate to the potential for the direct effects of silt run-off and pollution spillage from road and construction plant and the requirement for installation of additional discharge headwalls to the stream.

13.86 The vulnerability of existing aquatic communities of Hermitage Stream to such effects is considered to be low although the communities are vulnerable to prolonged exposure to any significant deterioration in water quality, especially prolonged input of fine sediment.

- 13.87 It is considered that with the adoption of appropriate Pollution Prevention Guidance (Reference 13.21) and SUDS design, combined with the incorporation of buffer strips alongside stream corridors to intercept any run-off, there will be **temporary adverse effect of neutral significance** on aquatic ecology and stream geomorphology during construction.

Operation

- 13.88 During operation of the road there may be a range of different magnitudes of impact from the Proposed Development including pollution and flood risk. There will be no requirement for water infrastructure as part of the operation of the road and therefore this will not be discussed further in this section. The DMRB considers a number of different methods for assessing the significance of effect on the water environment. These typically include;

- Method A - routine run-off;
- Method C - groundwater assessment;
- Method D - spillage risk assessment;
- Method E and F - Hydrological assessment and Hydraulic assessment; and
- Method E and F are not considered further here as requirements are met by the FRA which has including modelling to consider the crossing of Hermitage Stream. It is considered there is no additional flood risk due to the proposed link road crossing Hermitage Stream. Consideration of attenuation of run-off from increased impermeable area related to the proposed road is covered in the Sustainable Drainage Selection section of this chapter.

Method A - Routine Run-off Assessment

- 13.89 During operation, a wide range of potential pollutants could be associated with routine run-off from roads. Dependant on the type and concentration of pollutant there will be a consequent effect on ecology of the water body should pollution occur. The Design Manual for Roads and Bridges offers a number of methods of assessing both routine run-off and spillage risk. However the applicability of these tests depends on a key influencing factor. The key influencing factor on the routine run-off polluting capacity of a road is the Annual Average Daily Traffic flow (AADT). Generally, the higher an AADT flow, the greater the risk.
- 13.90 Where possible it is preferred to discharge water from the road to SUDS (or vegetative treatment) systems, replicating drainage existing in the natural environment. This will both provide treatment of road discharges and attenuation of road run-off. Before determining the type of drainage, the water quality of each catchment of the road will be assessed.
- 13.91 Table 13.3 describes the location of four proposed catchments along the road and the water environment receptor that it will discharge to. It is proposed that the link road discharges to a combination of Hermitage Stream and existing sewer, given known constraints of the size of the Site.

Table 13.3 - Road Catchments and Discharge Points

Catchment	Discharging to	Approximate Chainage
1	Existing sewer on Hulbert Road	0m
2	New outfall to Hermitage stream	320m
3	New outfall to Hermitage Stream	340m
4	Existing sewer on Woolston Road	1300m

- 13.92 Using information from the geometry of the road, traffic flow, hardness data and meteorological data, an assessment of each road catchment has been made using the Highways Agency Water Risk Assessment Tool (HAWRAT). River flow data has been taken from the National River Flow Archive database maintained by the Centre for Ecology and Hydrology. Where it is assumed drainage may discharge to sewer if no other discharge option is available, then a very low assumed flow of 0.001m³s⁻¹ has been taken. The results of the assessment are shown in Table 13.4.

Table 13.4 - Road Catchments HAWRAT Assessment

Catchment	Step 1	Step 2 – RST	Step 2 – RST	Step 2 – AAC	Step 2 – AAC	Step 2 – Sediment	Step 3 - Mitigation
1	Fail	Pass	Pass	Pass	Pass	Pass	-
2	Fail	Pass	Pass	Pass	Pass	Pass	-
3	Fail	Pass	Pass	Pass	Pass	Pass	-
4	Fail	Pass	Pass	Pass	Pass	Fail	Pass Sediment removal required

- 13.93 The results of the assessment showed that for catchments 1-3, without further mitigation all outfalls passed all assessments. Catchment four failed the test on sediment accumulation and deposition. Using guidance from Table 3.3 of HA103/06 and applying a 60% removal efficiency of sediment for a swale, Catchment 4 passed the HAWRAT assessment.

Method C - Groundwater Risk Assessment

- 13.94 Method C determines what action should be taken if there may be a risk to groundwater. Following the baseline investigation in this report it had been determined that the geology underlying the Site was clay which has very low permeability. For this reason it is proposed not to drain fully to ground. There were also no primary aquifers identified. The routine run-off assessments have shown that the soluble water quality as indicated by RST's for all catchments passes without further mitigation, bar Catchment 4 which is proposed to go to sewer. Therefore, any water that is discharged to surface features such as swales, that could provide an albeit unlikely pathway to groundwater, will not require any further mitigation such as lining. As such no further assessment using the Method C technique is required.

Method D - Spillage Risk Assessment

- 13.95 This assessment determines the likelihood that there will be a serious spillage risk that may harm the water environment. The highest predicted traffic flows of 24051 vehicles for the year 2026 were taken from the nearby Hulbert Road and will be used conservatively for this assessment. Table 13.5 shows the results of the Method D for each of the four catchments.

Table 13.5 - Road Catchments Serious Spillage Risk Assessment.

Catchment	Total Catchment Length (m)	Main Road Length (m)	Roundabout (m)	Side Road (m)	Spillage Risk Return Period (yrs)
1	200	150	50	-	2976
2	320	320	-	-	9559
3	320	70	50	200	1458
4	600	500	-	100	2825

- 13.96 Table 13.5 shows that none of the catchments break the threshold of 1 in 200 years for serious spillage risk, therefore no further specific mitigation is required for serious spillage risk. However, as part of the proposal for the new road, two roundabout links and other junctions to side roads have been proposed. Both of these types of locations would provide an increased risk of serious spillage. It is recommended that a storage area is provided that could be operated in the event of an emergency prior to discharge directly to a watercourse or an existing sewer. This may take the form of a swale, sized to provide attenuation. As best practise it would also be in keeping with the wider site design to provide sediment removal. This could also be provided by swales and gulleys. It is considered with appropriate mitigation that during operation there will be a **permanent adverse effect of neutral significance** on the surface water and groundwater quality relating to serious spillage risk.

Sustainable Drainage Selection

- 13.97 To aid mitigation of the operational effects of a new road scheme, PPS25, the PUSH SFRA and HBC Core Strategy recommend the consideration of SUDS during development.
- 13.98 The SUDS Manual provides a SUDS selection matrix which can be adapted to the drainage of the road and compliments the Design Manual for Roads and Bridges guidance on Vegetative Treatment Systems. This includes consideration of the land use characteristics, site characteristics, catchment characteristics, quantity and quality performance and use. The aim of using this selection matrix is to refine the selection of SUDS options for this Site by assessing these considerations.
- 13.99 Table 5.1 of The SUDS Manual suggests low trafficked roads should be considered like a commercial development, which only discounts source control such as rainwater harvesting from selection. The underlying soils of the road are clay like the rest of the Site, which presumes against the use of full infiltration drainage. The proposed slope of the road will mainly be gradual permitting the use of most types of SUDS. The approach to Hulbert Road, which is at a slightly increased gradient, will be kerbed with gulleys. Space alongside the road is quite constrained in some areas, particularly where the road is raised on embankment adjacent to Hermitage Stream. In these areas opportunities for SUDS such as wetlands, ponds and swales may be limited and kerb and gulley may be one of a few options for drainage. The key catchment characteristic for the road is Hermitage Stream, which has already been identified as of medium importance. Using Table 5.6 from The SUDS Manual it is suggested that the road is considered as a commercial zone and the receiving water sensitivity is medium. Therefore it would be appropriate to incorporate two levels of treatment.
- 13.100 It is suggested at this Site that a combination of gulleys and kerbs are used in areas restricted by space, and swales and wet swales (with some planting) are used alongside the road to provide two levels of treatment.
- 13.101 Assuming appropriate SUDS are used on this Site as suggested during operation, the effect of polluting run-off on surface water quality would be **permanent adverse of neutral significance**.
- 13.102 It is presumed that due to the ground conditions at this Site there would be no discharge to ground or even if there were it would be unlikely to permeate the clay substrate on site. Therefore the effect of polluting run-off on ground water quality is considered to be **permanent adverse of neutral significance**.
- 13.103 During operation there may be a risk of flooding either to the road or caused by the road.
- 13.104 It is known that there would be a potential flood risk from Hermitage Stream to the proposed road at the bridge crossing. A combination of increased cross sectional area due to restoration of Hermitage Stream and design of a free spanning bridge above known flood levels confirms that there should be a **permanent beneficial effect of neutral significance** to fluvial flood risk during operation. Further comment on the flood risk related to this bridge crossing can be found in the Flood Risk Assessment.

- 13.105 Prior to construction, detailed sizing should be undertaken for culverting of an on-site drain around drainage 675, taking into consideration this drain may receive discharge from a number of the proposed development plots. It is in the interests of the developer to ensure this culvert is appropriately designed as the area immediately upstream of the ditch crossing could flood in the event of flow restriction and is part of the Site. It has been assumed for the purposes of this report that there will be no impact from appropriate design of this culvert during operation.
- 13.106 Spot checks on groundwater levels have identified that the closest point of water to ground level was 3.15m below ground (Reference 13.17). There are no known historical records of persistent groundwater flooding. It is assumed that should any high water levels be identified on site during more detailed site investigation prior to construction that it would be likely that this water would be perched and therefore isolated above the generally clayey ground conditions. It is considered that groundwater flood risk will produce a **permanent adverse effect of neutral significance**.
- 13.107 During operation the increased impermeable area of the road surface will generate increased runoff to be discharged to the water environment. This could create an increased surface water flood risk. In accordance with the DMRB and PPS25 this should be mitigated to ensure no increased flood risk.
- 13.108 It is proposed the road will have four catchments. These are shown on Figure 13.1. To the west of the Site the road ties in with Hulbert Road at a proposed roundabout. The roads north and south of this roundabout are known as Catchment 1. Drainage will continue to discharge to the existing drainage system to the south of the roundabout. As there is an increase in the existing hardstanding, sufficient attenuation will be provided to ensure no additional flow from the proposed road.
- 13.109 From the proposed Hulbert Road roundabout eastwards there are three other main catchments. Catchment 2 contains two sub catchments, 2a and 2b. Catchment 2a will drain the new Hulbert Road roundabout with kerbs and gulleys towards a section of road that will be drained by swale, eventually outfalling at a low point directly to Hermitage Stream. The swale will provide both pollution removal and attenuation and should provide capacity to store required attenuation volumes as shown in Table 13.6. Catchment 2b will drain the proposed bridge over Hermitage Stream toward the low point again with a combination of bridge drainage and swale providing pollution removal and attenuation directly to a second outfall to Hermitage Stream. Catchment 3 will discharge westwards via a combination of swales and kerbs and gulleys and discharge directly into the Hermitage Stream at a third outfall just to the north side of the proposed crossing of Hermitage Stream. Catchment 4 will discharge westward receiving over the edge drainage into a wet swale that will provide attenuation. This will then be discharged at restricted rates to existing sewer at Woolston Road.
- 13.110 All drainage associated with the road shall be kept separate from any other site drainage.
- 13.111 Table 13.6 shows allowable discharge rates and required volumes of storage for a 1 in 100yr event plus 30% storage.
- 13.112 The proposed swale would have to discharge under connector roads; therefore it is proposed that prior to construction the swale depth, and appropriate sizing of pipes under the road should be determined to enable this.
- 13.113 It is proposed that the swales could be used to contain any serious spillage by using either drop boards or sandbags that could be dropped into a designated area of the swales.

Table 13.6 - Road Catchments and Attenuation Requirements to Ensure Greenfield Discharge

Catchment	Greenfield Run-off Rate (l/s)	Area to be Drained (ha)	Attenuation Requirement (m ³)	Receptor
1	0.3	0.1	98	Existing sewer
2a	2.1	0.6	394	Hermitage Stream
2b			179	Hermitage Stream
3	1.7	0.5	473	Hermitage Stream
4	2.1	0.6	563	Existing Sewer

- 13.114 During operation it is considered the effect of increased surface water flooding is **permanent adverse of neutral significance**.
- 13.115 It is proposed that maintenance of the drainage be provided in accordance with the best provision found within The SUDS Manual guidance, the Design Manual for Roads and Bridges or local highway authority guidance.
- 13.116 During operation, the discharges from the Proposed Development will be attenuated to prevent any increase in discharge rates. They will also be treated with an appropriate level of treatment. On this basis it is considered that the effect of the Scheme on discharges would be **permanent adverse of neutral significance**.
- 13.117 During operation there will be no abstraction required for the road scheme. It is considered there will be a **permanent adverse effect of neutral significance** on abstractions during operation.
- 13.118 In operation, the restored section of the Hermitage Stream will provide betterment to both stream habitat quality and stream ecology. This is due to the replacement of the concrete lined channel (approximately 100m) with a more sinuous and natural soft banked channel length and the provision of greater habitat heterogeneity for the current ecological communities of the stream, i.e. macroinvertebrates and bullhead fish populations. It is considered that the effect on both aquatic ecology and stream geomorphology as a result of the restoration will be **permanent beneficial of slight significance**.
- 13.119 Modelling has been undertaken as part of the FRA to ensure that restoration of Hermitage Stream will not affect flood levels, particularly downstream toward Leigh Park. Results have shown that further than 100m downstream of the restoration there is actually a slight reduction in flood level and then no change from then on. There is one section of the restoration, between the A3 (M) and upstream of the proposed restoration, where levels will increase by 60mm in a 100 year event. However, even in this area it has been shown that the river will remain in bank no near than 0.64metres to overtopping. Therefore, it is considered that overall the flood risk related to restoration will have a **permanent adverse effect of neutral significance**.
- 13.120 Assuming appropriate SUDS are used and maintained appropriately during operation, the effect of polluting run-off and changes in surface water quality on aquatic ecology and geomorphological quality of Hermitage Stream is assessed as **permanent adverse of neutral significance**.
- 13.121 Bridge shading effects are also considered during operation as a result of the required road crossing of Hermitage Stream. The deck height is likely to preclude the development of instream and marginal vegetation due to shading impacts. Despite this, these negative effects are considered to be significantly off-set by the provision of the restored channel length.

Proposed Development Design Assessment

- 13.122 Based on the baseline information available and the chosen method of assessment, the likely significant effects of the Proposed Development both during construction and operation have been considered. Table 13.11 provides a summary assessment of this section.

Construction

- 13.123 National and local guidance provides good direction on best practise to avoid pollution and flood risk during construction. Adherence to the Environment Agency Pollution Prevention Guidelines outlined below (Reference 13.21) will aid prevention of flooding and incidental impacts and preserve water quality during the works and operation period:

- Pollution Prevention Guidelines 1 - General guide to the prevention of pollution;
- Pollution Prevention Guidelines 2 - Above ground oil storage tanks;
- Pollution Prevention Guidelines 5 - Works and maintenance in or near water;
- Pollution Prevention Guidelines 13 - Vehicle washing and cleaning;
- Pollution Prevention Guidelines 21 - Pollution incident response planning; and
- Pollution Prevention Guidelines 22 - Incident response dealing with spills.

- 13.124 A Construction Environmental Management Plan will be required to ensure that methods of best practice are followed.

- 13.125 Further specific impacts and potential effects of construction are considered for key water receptors in the following sections.

Surface Water and Ground Water Quality

- 13.126 Increased silt loading or spillages could impact on surface waters or groundwaters. In particular this may have an effect on the ecology of Hermitage Stream and Park Lane Stream.
- 13.127 The overall effect of construction on surface water and ground water quality is **temporary adverse of neutral significance**.

Abstractions and Discharges

- 13.128 During construction any requirement for abstraction licences, dewatering and discharge consent related to construction should be determined through the Environment Agency.
- 13.129 It is considered the overall effect of construction on abstractions and discharges is **temporary adverse of neutral significance**.

Fluvial Flood Risk

- 13.130 Construction will take place outside of the flood zones of Hermitage Stream and Park Lane Stream. Care should be taken to ensure that any building materials are also stored outside of the flood zone.
- 13.131 The effect of construction on flood risk for the site would be **temporary adverse of neutral significance**.

Groundwater Flood Risk

- 13.132 Site tests have confirmed there is no known groundwater within 3m of ground level (Reference 13.17). However, prior to construction investigations should be undertaken to confirm local groundwater levels.
- 13.133 Given the underlying clay geology of the Site it is considered that the effect of the development on groundwater is **temporary adverse of neutral significance**.

Pluvial Flood Risk

- 13.134 The PUSH SFRA identifies the existing pluvial flood risk as moderate throughout the Site. Construction is likely to involve the introduction of new temporary impermeable surfaces. This has the potential to increase the rate and volume of surface water runoff from the Site and therefore the risk of surface water flooding. Any increase in runoff should be attenuated before discharge from the site. Assuming that suitable mitigation measures are put in place, there will be no change in the surface water flood risk during the construction phase. It is considered the effect of pluvial flood risk should be **temporary adverse of neutral significance** assuming the developer provides evidence of detailed drainage.

Water Infrastructure

- 13.135 Two key measures that could be implemented to reduce impact on water infrastructure are:
- Where feasible, water efficient measures should be provided for site staff facilities; and
 - Processes such as site dampening during construction (to reduce dust) should preferentially select water efficient measures.

- 13.136 The overall effect of construction on water infrastructure is considered to be **temporary adverse of neutral significance**.

Aquatic Ecology and Stream Habitat Quality and Geomorphology

- 13.137 Indicative design construction phases are considered unlikely to create any additional risks to aquatic ecology although additional pathways of effect may present e.g. due to implementation of additional SUDS infrastructure, including the potential requirement for new outfall structures discharging surface waters to both Hermitage Stream and Park Lane Stream.
- 13.138 Assuming appropriate PPGs and consented design for any required outfalls or headwalls are adopted, the assessment of the effects of polluting run-off and changes in surface water quality on aquatic ecology and geomorphological quality of Hermitage Stream and Park Lane Stream is assessed as **temporary adverse of neutral significance**.
- 13.139 Following construction there will be a **neutral or slight adverse effect** on the water environment for low importance and medium importance attributes respectively.

Operation

- 13.140 It is expected that the development of the drainage on the Site will take place in a number of stages. The restoration of a section of Hermitage Stream is proposed at the earliest stage and is expected to be developed alongside the link road.

Surface Water Quality and Ground Water Quality

- 13.141 The potential effects of the Proposed Development on surface water and groundwater quality are to a large extent determined by the appropriate selection and use of SUDS as guided by local and national legislation PPS25 and HBC Core Strategy policy CS15.
- 13.142 Using the method from The SUDS Manual, a level of treatment could be a number of different plots on this site as shown labelled A-G on Figure 13.1.
- 13.143 Following SUDS guidance to mimic natural catchment processes of attenuation and pollution control as closely as possible a “management train” is required. Drainage techniques should be used to incrementally reduce pollution, flow rates and volumes. Techniques involved in the management train could include prevention (or pre-treatment), source control, site control and regional control. Source control requires management of run-off at or very near its source. Examples of source control include soakaways, infiltration green roofs and pervious pavements. Site Control is the management of water in a local catchment routed from elsewhere such as building roofs and car parks. This could be in the form of a large soakaway infiltration or detention basin. Regional

control would suggest the management of run-off from several catchments usually in a balancing pond or wetland area.

13.144 In general it is recommended that areas much greater than 2 ha do not drain to a single SUDS component. On a site as large as Dunsbury Hill this would require a number of different SUDS components and catchments. These are indicated on Figure 13.1.

13.145 The planning land use type B2 indicates that 3 levels of SUDS including pre-treatment would be recommended for most of the Site. However, should a catchment within the Site only consist of B1 or B8 use, then this requirement should be reduced to 2 levels.

13.146 The level of importance of the receiving water also helps to determine the level of SUDS treatment on a site. Using a modified table from The SUDS Manual guidance Table 13.7 below shows the level of SUDS treatment required on the site for B1, B2 and B8 land use.

Table 13.7 - Levels of SUDS Treatment Related to Land Use at Dunsbury Hill

Land Use	Importance of Receiving Water Attribute		
	Low	Medium	High
B1, B8	2	2	3
B2	3	3	4

13.147 An example of a treatment train with two levels of treatment would be a permeable pavement draining to a detention basin.

13.148 An example of a treatment train with three levels of treatment would be a permeable paving to a retention pond (including sedimentation and biodegradation).

13.149 An example of a treatment train with four levels of treatment would be a green roof then permeable paving to a retention pond (including sedimentation and biodegradation) with planting to allow vegetative filtration.

13.150 Using CIRIA SUDS guidance there are five selection criteria that can help determine application of SUDS within a site. These include:

- Land use characteristics;
- Site characteristics;
- Catchment characteristics;
- Quantity and quality performance requirements; and
- Amenity and environmental requirements.

13.151 The land use characteristics proposed are light industrial (B2), business (B1) and storage (B8). Any roof drainage should need minimal treatment. Treatment of run-off from roads other than the previously mentioned link road will depend on the sensitivity of the watercourse. Traffic flows at this development will be relatively low although will include HGVs. For commercial developments, 2 levels of treatment should generally suffice. However, where there are light industrial developments, 3 levels of treatment will be required. For areas that have higher pollution levels, infiltration measures (such as infiltration trench, infiltration basin and infiltration soakaway) would not be preferred. Neither would rainwater harvesting for anything other than greywater use. Some light industrial components such as permanent skip areas, yards with chemical storage, pressure washing areas or fuelling areas are recommended to be connected to the foul sewer.

13.152 Using guidance Table 5.3 of The SUDS Manual, the site characteristics at Dunsbury Hill can be prescribed. The underlying soils are clay allowing little infiltration. This would discount direct infiltration for the majority of the Site. The groundwater depth is considered to be around 3m deep as indicated by site spot checks. Wherever possible there should be localised SUDS treatment with less than 2 ha discharging to a single SUDS component. Steeper slopes limit some SUDS

practises such as wetlands or infiltration but this will not restrict SUDS for the majority of the Site. Certain SUDS techniques such as swales and ponds require a level of head to operate correctly. Therefore as each plot or connected plots are developed there will be consideration of the topographical drainage provided by the plot.

- 13.153 The catchment characteristics include no freshwater fisheries within 1km of proposed discharges, no aquifers used for public water supply, no surface waters used for public water supply, no coastal and estuarine waters within 1km and no formal amenity on receiving waters. However, there is a requirement on this Site to ensure any discharges do not affect restoration of Hermitage Stream and there is also a requirement for ensuring no increase in run-off rates above existing levels. It may be that some intended uses for the Site could require discharge to foul sewer which should be avoided.
- 13.154 With regard to quantity and quality performance, consideration should be given to the type of pollutant that may be produced by land use on the Site and the prevention requirements of the key receptors. Across this Site the key receptors would be Hermitage Stream and Park Lane Stream. Given the proposed uses, consideration of removal of total suspended solids (TSS) and heavy metals would reflect the general type of pollution to be expected. It is recommended that permeable paving, ponds (detention and retention) and underground storage be considered. It may also be possible to incorporate underdrained swales and bioretention where groundwater levels are more than 1m below the invert of the drainage feature.
- 13.155 With regard to amenity and environmental performance, the maintenance regime is a key component in the management of this Site and would be based on best practise guidance in the SUDS Manual (Reference 13.9) or local authority guidance, whichever is more stringent at the time of construction. A record of maintenance work should be kept available for inspection. As no domestic properties are proposed there is little issue with public acceptability. Users of the Proposed Development may benefit from SUDS enhancing amenity around the Site. Seating areas, information boards and appropriate health and safety measures could be considered. Although by design SUDS are likely to provide some wildlife habitat, there is no specific requirement for SUDS to provide additional habitat at the Site. Where planting is undertaken as part of a SUDS feature it is suggested that local plants should be considered and that contact with the local Wildlife Trust or other environmental bodies should be made to determine what may be the best local planting requirements. Local Biodiversity Action Plans should also be considered.
- 13.156 Prior to construction it is recommended that more detailed modelling, using a software package such as Microdrainage, be undertaken for the Site to provide more certainty regarding the operation of drainage within the Proposed Development. In particular it is suggested that the development of any regional collector pond or ponds should be put in place at an early stage.
- 13.157 It is recommended to produce a site management plan that would be used across the development by the maintenance staff for the drainage systems. A key component of the site management plan would be a maintenance regime for the drainage of the Site. It is proposed here that this should be based around the SUDS Manual.
- 13.158 It is considered that with the proposed implementation of appropriate levels of SUDS treatment across the Site, the overall effect of operation on surface water and ground water quality is **permanent adverse of neutral significance..**

Abstractions and Discharges

- 13.159 There were no existing abstractions and discharges identified to be affected by the Proposed Development in the baseline assessment. There are no proposals for new operational abstractions and discharges. The effect of operation on abstractions and discharges is **permanent adverse of neutral significance.**

Flood Risk

- 13.160 There is no fluvial flood risk related to the Proposed Development as outlined in the baseline section of this report.
- 13.161 The effects of the restored part of Hermitage Stream on fluvial flood risk have been considered within the detailed road operational section of this report. As it is proposed that the restoration of the stream and road development are constructed prior to operation of the Proposed Development, it is considered there are no further likely significant effects from the restoration on fluvial flood risk during operation of the Proposed Development that has not already been considered.
- 13.162 The overall effect of operation on fluvial flood risk is **permanent beneficial of neutral significance** due to improvements in flood levels downstream of the restoration.
- 13.163 During operation it is proposed that no water should discharge to ground. As known groundwater levels have been observed greater than 3m below ground level, the ground material is relatively impermeable and it is proposed not to directly discharge to groundwater. It is considered that there will be no significant change in groundwater levels.
- 13.164 The overall effect of operation on groundwater flood risk in **permanent adverse of neutral significance**.
- 13.165 New developments have the potential to alter the pathway and speed of surface water run-off. To ensure that there is no increased flood risk the pre-development Greenfield Run-off Rates have been calculated using Microdrainage software and are shown in Table 13.8.

Table 13.8 - Greenfield Run-off Rates for Various Return Periods

	Return Period (yrs)			
Pre development Greenfield Run-off Rates	QBAR	1	30	100
l/s/ha	3.4	2.9	7.7	10.9

- 13.166 Due to the increased impermeable area of the Proposed Development, there will be an increase in run-off rates post development. Using Microdrainage software, an estimate has been made of the attenuation storage area required on this site to provide QBAR Greenfield Run-off Rate restriction for a 100 year storm event plus 30% additional volume for climate change. This follows the best practise guidance of PPS25 and the Interim Code of Practise for SUDS.
- 13.167 Using Microdrainage software an indication of storage requirements on this Site have been calculated and are shown in Table 13.9. These show that the attenuation required at this Site is approximately 10% of the impermeable area based on a 1m deep storage area. An illustration of where storage could be provided on site is shown in Figure 13.1 based on a 1m deep pond or subsurface storage area. Topographical overland flow routes are also marked onto this figure. This would be the route of water should an even more extreme event occur than the system is designed for.

Table 13.9 - Attenuation Requirements (m³) for Dunsbury Hill Farm Site

	Return Period (yrs)			
	1	30	100	100+30%(CC)
Phase 1 (13.2ha)	2666	6771	8956	12491
Phase 2 (7ha)	1414	3591	4750	6625
Total (20.2ha)	4080	10363	13706	19177

13.168 Prior to construction the connectivity of the ditch network discharging across the Site should be fully established to ensure the capacity of drainage ditches is not exceeded.

13.169 Considering the attenuation proposed by selection of appropriate SUDS at this Site, it is considered the effects of surface water flood risk at this Site will be **permanent adverse of neutral significance**.

Water Infrastructure

13.170 A mixed land use is proposed at this Site. Although at this stage the specific apportionment of certain types of land use within the Site is not known there are a number of key principles that could lead to the efficient use of water on this Site. These principles have been guided by the BREEAM assessment method for Sustainable Offices (Reference 13.8).

13.171 It is proposed that water efficient methods would be preferred with regard to type of industry and their use. There are a number of different ways water efficiency can be achieved including:

- Use of water butts for landscaping / irrigation;
- Use of efficient water heating;
- Water efficient fittings in staff facilities including urinals, taps and showers; and
- Green roofs - particularly applicable to smaller offices and would represent a method of source control for SUDS.

13.172 As part of the submission of design stage information to meet BREEAM sustainability criteria the developer would be expected to submit technical specifications of fittings, a plan of location of fittings and a BREEAM calculator.

13.173 Although there is an indication that there is capacity for drinking water supply, provision of water efficient fittings will reduce the impact of the Proposed Development.

13.174 It is proposed that further consultation and provision of more detailed information should be provided to the local water supply company, Portsmouth Water, as part of a detailed planning application.

13.175 The overall effects of operation on potable water supply is **permanent adverse of neutral significance**.

13.176 Southern Water has provided an indication that there is sufficient existing capacity for the early stages of the Proposed Development to discharge to sewers. However, it has been recommended that before any construction is undertaken, further full development checks are made. Budd's Farm wastewater treatment works has a constrained consent with capacity for planned housing development, but may not have sufficient capacity for additional industrial flows. Therefore there is a general requirement on the development for a high level of water efficiency in order to minimise additional sewage flows (Reference 13.2).

13.177 Although there is an indication that there is capacity for foul water removal through communication with the sewerage provider, there may be a change in these circumstances prior to construction.

13.178 It is proposed that further consultation and provision of more detailed information should be provided to the sewerage provider as part of a detailed planning application.

13.179 The overall effects of operation on water infrastructure is **permanent adverse of neutral significance**.

Aquatic Ecology and Stream Habitat Quality and Geomorphology

13.180 Assuming appropriate maintenance of SUDS installations, the effects relating to changes in surface water quality and quantity on aquatic ecology and geomorphological quality of the Hermitage Stream including the proposed restored section and Park Lane Stream is assessed as **permanent adverse of neutral significance**.

Cumulative Effects

- 13.181 The proposed Havant Thicket water reservoir immediately to the north-east of Park Lane Stream has been considered due to its proximity to the Site. The construction of the water reservoir could introduce increased HGV flow through the proposed link road during construction. However, due to a proposed control bus gate at Woolston Road this will not affect the level or effectiveness of mitigation proposed in this report for the link road. It is understood that there would be no alteration to the flow or location of Park Lane Stream as a result of the proposed Havant Thicket development. It is also considered that there would be a negligible risk of breaching of the storage reservoir affecting the Proposed Development. The overall effect of the potential development of Havant Thicket reservoir is **neutral** during construction and operation.

Summary

- 13.182 It is assumed that for the water environment there will be **no significant residual effects** following design intent either during construction or operation.
- 13.183 The key water environmental receptors at the site include Hermitage Stream and Park Lane Stream. It is assumed that much of the surface water run-off will be discharged to these receptors. Due to the type of geology and the soils of the Site there will be no drainage directly to infiltration.
- 13.184 The provision of a restored section of Hermitage Stream will provide minor ecological geomorphological and local flood risk benefits to this Site.
- 13.185 Consent will be required for any new headwalls that will discharge into either Hermitage Stream or Park Lane Stream through consultation with the Environment Agency and should be applied for as they are required in the development of the Site.
- 13.186 The level of pollution from run-off from the main link road is low. However, to follow best practise and the general drainage philosophy for the Site, it is proposed that a form of sediment retention, such as swales or gulley pots, is used, and storage provided for a serious spillage at the roundabouts to the west of the Site.
- 13.187 The Proposed Development will increase impermeable areas on Site and will require attenuation mitigation as proposed in Tables 13.6 and 13.9.
- 13.188 The differing land use will require different levels of mitigation. Examples of the different levels of mitigation have been described in Table 13.7.
- 13.189 During construction, design intent and best practise mitigation has determined that the significance of effects for both the detailed road application and the overall Proposed Development are **neutral**.
- 13.190 During operation of the main link road there are **slight beneficial** effects to fluvial flood risk, aquatic geology and geomorphology associated with the Hermitage Stream Restoration as shown in Table 13.10.

Table 13.10 - Operational Effects (Detailed Road Design assuming inclusion of restoration)

Receptor	Value	Magnitude of Impact	Significance of Effects
Park Lane Stream and Hermitage Stream (surface water quality)	Medium	Negligible adverse	Neutral
Groundwater water quality	Low	Negligible adverse	Neutral
Fisheries/recreational users	Scoped out at baseline assessment		
Fluvial flood risk	Medium	Negligible beneficial	Neutral
Groundwater flood risk	Low	Negligible adverse	Neutral

Receptor	Value	Magnitude of Impact	Significance of Effects
Pluvial flood risk	Low	Negligible adverse	Neutral
Existing discharges/abstractions	Low	Negligible adverse	Neutral
Water supply	Low	Scoped out at potential impact	
Foul Water	Low	Scoped out at potential impact	
Aquatic Ecology	Medium	Minor beneficial	Slight beneficial
Geomorphology	Medium	Minor beneficial	Slight beneficial

13.191 During operation of the Proposed Development, which is assumed to have been constructed after restoration of Hermitage Stream and the link road, there will be **permanent adverse effects of neutral significance** to the water environment as shown in Table 13.11.

Table 13.11 - Assessment Summary Operational Effects (Outline Masterplan)

Receptor	Value	Magnitude of Impact	Significance of Effects
Park Lane Stream and Hermitage Stream (surface water quality)	Medium	Negligible adverse	Neutral
Groundwater water quality	Low	Negligible adverse	Neutral
Fluvial flood risk	Medium	Negligible beneficial	Neutral
Groundwater flood risk	Low	Negligible adverse	Neutral
Pluvial flood risk	Low	Negligible adverse	Neutral
Existing discharges/abstractions	Low	Negligible adverse	Neutral
Water supply	Low	Negligible adverse	Neutral
Foul Water	Low	Negligible adverse	Neutral
Aquatic Ecology	Medium	Negligible adverse	Neutral
Geomorphology	Medium	Negligible adverse	Neutral

13.192 The restoration of hermitage stream has provided a net beneficial residual effect as shown in Table 13.12.

Table 13.12 - Assessment Summary of Residual Effects.

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Water environment	Construction Environment Management Plan	Temporary adverse effect of neutral significance
Operation		
Water environment	Sustainable drainage system; a drainage site management plan; water efficiency measures; further consultation and provision of more detailed information should be provided to the sewerage provider at detailed planning application stage	Permanent adverse effect of neutral significance
Hermitage Stream	Restoration of approximately 100m of Hermitage Stream provides improved and	Permanent beneficial effect of slight

	increased extent of aquatic ecology habitat.	significance
	Removal of existing channelized section of Hermitage Stream and weirs improving stream geomorphological form and sediment transfer.	Permanent beneficial effect of slight significance

References

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- 13.2 Dunsbury Hill Farm, Stage 1: Feasibility Study, 2010, PUSH, PCC and HBC, Atkins.
- 13.3 HD45/09 Road Drainage and the Water Environment, 2009, Design Manual for Roads and Bridges Volume 11 Section 3 Part 10, The Highways Agency.
- 13.4 HA103/06 Vegetated Drainage Systems for Highway Runoff, 2006, Design Manual for Roads and Bridges Volume 4 Section 2 Part 1 The Highways Agency.
- 13.5 Planning Policy Statements, Department for Communities and Local Government. <http://www.communities.gov.uk/planningandbuilding/planningsystem/planningpolicy/planningpolicystatements/> visited 23/05/2011.
- 13.6 South East Plan, Regional Spatial Strategy for the South East of England, 2009, Government Office for the South East.
- 13.7 Havant Borough Core Strategy. <http://www.havant.gov.uk/havant-7154>.
- 13.8 BREEAM Offices Issue 4, 2010, BRE Global Ltd.
- 13.9 CIRIA (c697), The SUDS Manual, 2007, CIRIA, London.
- 13.10 Water Framework Directive (2000/60/EC).
- 13.11 South East River Basin Management Plan, 2009, Environment Agency.
- 13.12 Partnership for Urban South Hampshire Strategic Flood Risk Assessment, 2007.
- 13.13 Water Resources Act, 1991, Chapter 57.
- 13.14 The Water Environment sub-objective, TAG Unit 3.3.11, 2003, Department for Transport.
- 13.15 Various websites including; The Environment Agency <http://www.environment-agency.gov.uk/>, British Geological Survey <http://www.bgs.ac.uk/data/boreholescans/home.html>, MAGIC <http://magic.defra.gov.uk/>, Natural England <http://www.naturalengland.gov.uk/>.
- 13.16 South East River Basin Management Plan, 2010, Environment Agency.
- 13.17 Geotechnical Interpretative Report, 7/8th June 2011, Site investigations, 5095618/GTG/20093038/001.
- 13.18 Environment Agency, 1999. Procedures for Collecting and Analysis Macroinvertebrate Samples (issue 2.0) Environment Agency BT001.
- 13.19 "Habitats and Species Directive", Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, 1992.
- 13.20 CIRIA (c648) Control of Water Pollution from Linear Construction Projects, 2006 CIRIA, London.
- 13.21 Pollution Prevention Guidelines, Environment Agency, <http://www.netregs.gov.uk/netregs/links/107968.aspx> visited on 23/05/2011.

14 Landscape and Visual Assessment

Introduction and Scope of Topic

- 14.1 This chapter considers the likely significant effects of the Proposed Development as described in Chapter 4 on the existing landscape and townscape resource and views of receptors at two scales; at a regional level and a local level within a defined study area.
- 14.2 At a regional level the assessment considers the effects of the Proposed Development on sensitive landscape receptors including:
- South Downs National Park; and
 - Chichester Harbour Area of Outstanding Natural Beauty (AONB)
- 14.3 At a local level the assessment considers the effects of the Proposed Development on the landscape character within the Havant Strategic Gap and sensitive receptors within the study area. These include Staunton County Park and the bridleways and footpaths that make up the Green Infrastructure of South Hampshire and the Forest of Bere and that link Waterlooville, Dunsbury Hill, Staunton County Park and Havant Thicket Reservoir.
- 14.4 The study area is part of the landform associated with the Hermitage Stream and tributaries including Park Lane Stream defined by: the low ridge at Dunsbury Hill to the north at 50m AOD that continues west and south through Waterlooville, Stakes, and Crookhorn; Cabbagefield Row at 40m AOD to the east; and Leigh Park to the south. The containment provided by the topography is reinforced by the extent of existing woodland planting and green infrastructure which limits the extent of likely local effects.

Scoping Response

- 14.5 Landscape and visual assessment issues raised by respondents to the EIA Scoping Report are summarised in Table 14.1

Table 14.1 - Scoping Response - Landscape and Visual Assessment Issues

Issue Raised	Respondent
In relation to Landscape Character and Designated Areas, consideration should be given to the following aspects in the EIA: Potential impacts of scheme on landscape character and visual amenity of surrounding area Detailed design of proposed improvements to respect and enhance local character and distinctiveness, and use appropriate materials and design in all new built features	Simon Thompson, Natural England, Government Team (comment as at 15 March 2011 to the original Scoping Report).
The development site is within/ adjacent to the South Downs National Park and the Chichester Harbour Area (AONB). In particular, there is concern over the potential effect of the development on the natural beauty, local character and distinctiveness of the AONB and the ES should include a full assessment of these effects.	
Full regard should be paid to the Chichester AONB Management Plan.	
With regard to historic Landscapes, it should be considered whether there is land qualifying for conditional exemption from	

Issue Raised	Respondent
capital taxes on the ground of outstanding scenic, scientific or historic interest (cross ref to chapter on Cultural Heritage).	
Local landscape character areas should be mapped at a scale appropriate to the development site and relevant management plans or strategies pertaining to the area. The EIA should include a full assessment of the potential visual and landscape impacts of the development on local landscape character using landscape assessment methodologies.	
Any proposal to incorporate measures to help encourage people to access the countryside for quiet enjoyment would be encouraged. Measures to reinstate and create footpaths and bridleways are to be encouraged. Links to other green networks or urban fringe areas should also be explored.	
The potential effect of development on the natural beauty, local character and distinctiveness on the South Downs National Park and Chichester Harbour AONB should be considered. Further details required regarding local landscape character areas mapped at a scale appropriate to the development site and any relevant management plans of strategies pertaining to the area. Visual effects on the surrounding area, landscape and any physical effects should be considered using landscape methodology.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).
There is limited information regarding landscape quality assessment for trees/ woodlands.	

Key Aspects of the Project

14.6 The Proposed Development will be implemented in two phases:

- Phase 1 (13.2ha) - construction to commence in 2014 with occupation from 2016 onwards; and
- Phase 2 (7ha) - construction to commence in 2020 with occupation from 2022 onwards.

14.7 The proposed layout has been informed by the findings of the assessment, including the desk study of relevant reports and the site survey of key representative viewpoints. A Landscape Masterplan has been formulated during the design process and includes the primary mitigation measures, i.e. those which have been incorporated into the Development Specification, as a result of the assessment process in order to alleviate and minimise impacts where possible. These primary mitigation measures are summarised below – with further additional mitigation measures identified as part of the LVIA findings:

- Identification of environmental management objectives, the management of existing woodland planting and hedgerows on site and structure planting undertaken in advance of the start of works would help to maintain the existing landscape framework and prioritise resources to enhance the green infrastructure;
- A strong wooded character is proposed across the Site, reinforcing existing boundaries on the western edge of Havant and reinstating the historic landscape framework and visual links with the existing pre-1810 woodland planting severed by the A3 (M) corridor. The existing landscape structure of key features including existing woodland, shelterbelts and hedgerows and important trees, should be retained and reinforced in Phase 1 to maintain the semi enclosed character and further develop the visual containment provided by the 'woodland cell' character of the Site. Broad 35 metre wide bands of woodland planting should be established across the Site following the contours of the shallow valley sides and extending eastwards into the Site from Beech Wood. The implementation and establishment of the

woodland planting over 15 years as part of Phase 1 will help to accommodate the buildings and infrastructure implemented as part of Phase 2;

- Enhanced green infrastructure links between Havant Thicket Reservoir, Dunsbury Hill and the amenity open space west of Ramsdale Avenue on the edge of Leigh Park are proposed;
- Lighting - a combination of low level and fixed column full cut off lighting will help to minimise the visual impact;
- The lowest part of the Site lies at approximately 20m AOD and rises to almost 45 metres in the north. Areas of new development should avoid elevated areas where they would be viewed against the skyline. To minimise the building height the roofline of the buildings should be kept below the 40m contour during Phase 1 to maximise the screening effect of Beech Wood and planting alongside the A3 (M) corridor. During Phase 2 the building height should be kept below the 45m contour to ensure that Dunsbury Hill and Bell's Copse and the planting to the east of Park Lane Stream will screen views into the Site;
- Opportunities to integrate the buildings into the landscape using green roofs and below ground parking to minimise hard standing areas and maximise areas for the landscape framework;
- The Site layout and associated earthworks will reflect the shallow valley landform gently sloping south to Hermitage Stream and the tributary Park Lane Stream in the west;
- Opportunity for an attractive gateway feature; and
- Restoration to Hermitage Stream and the provision of a new wetland feature will provide wildlife benefits and increased flood storage capacity as well as enhancing the appearance of the stream as a key landscape feature of the local landscape character.

Relevant Legislation, Policies and Guidelines

- 14.8 The Site is within Havant Borough Council (HBC) administrative area, whose landscape policies are covered within the HBC Core Strategy. Chapter 3 details planning policy relevant to the Site which has informed the assessment and landscape masterplan design.
- 14.9 The following publications were reviewed to describe the regional Landscape planning set out in the table below and local landscape character, which forms part of the subsequent baseline section. This review also identified issues and management objectives that should be considered in the assessment and design.
- The Regional Landscape Planning Context -The Character of England: Landscape, Wildlife and Natural Features Map and Countryside Character Volume 7, South East & London (1999);
 - Formation of Strategic and Local Gaps (2008);
 - South Downs National Park 2011;
 - Chichester Harbour AONB Management Plan 2009-2014;
 - Countryside Access Plan for the Forest of Bere 2008-2013;
 - The Hampshire Landscape: a Strategy for the future, August 2000;
 - The Hampshire Historic Landscape 2007;
 - Havant Borough Townscape, Seascape and Landscape Assessment (February 2007); and
 - Havant Borough Landscape Character Assessment Sensitivity Report (2007).

- 14.10 The following Table 14.2 summarises the aspects of relevance to the Site and should be read in conjunction with Figure 14.1, Broad Landscape Planning Context, detailing the wider contextual designations.

Table 14.2 - Summary of Relevant Landscape Planning Issues

Designation	Landscape Planning Issues
The Character of England: Landscape, Wildlife and Natural Features Map	The Application Site lies within the approximately 2km wide eastern extent of NCA 128 <i>South Hampshire Lowlands</i> between the NCA 125 <i>South Downs</i> and NCA 126 <i>South Coast Plain</i> . NCA 128 is described as an undulating plain mainly in agricultural use. The site is close to the setting of the South Downs that coincides with NCA 125 <i>South Downs</i> .
The South Downs National Park	The South Downs National Park is part of the former East Hampshire and Sussex Downs Area of Outstanding Natural Beauty and as such this designation recognises the quality and sensitivity of this landscape resource. There are no views to or from the South Downs National Park from the Site. The Site does not impose on the setting of the South Downs National Park; the policy is therefore not relevant to the Proposed Development.
Chichester Harbour Area of Outstanding Natural Beauty	Chichester Area of Outstanding Natural Beauty (AONB) is managed by The Conservancy which was established by the Chichester Harbour Conservancy Act 1971. Its duty is the conservancy, maintenance and improvement of the Harbour and the Amenity Area for recreation and leisure, nature conservation and the natural beauty. The nearest point of Chichester Harbour AONB to the Site is at Wade Court to the south of the A27 on the edge of Havant, which lies approximately 3.5km to the south east. There are no views to or from the Chichester Harbour AONB from the Site. The Site does not impose on the setting of the Chichester Harbour AONB; the policy is therefore not relevant to the Proposed Development.
Hampshire Historic Landscape Assessment	The County Council has published the Hampshire Historic Landscape Assessment – this is a map based resource that sets out how the present landscape has developed. It identifies the Site as being within an area of ‘medium regular fields with straight boundaries.’ The document identifies specific components within the broader County landscape character areas, and it shows the site as lying within the ‘ <i>North Havant Mosaic</i> ’ component of the <i>Mixed Farmland and Woodland</i> character area.

Approach to Assessment

- 14.11 LVIA is largely a subjective discipline, due to the human interpretation of existing landscape features and elements. A methodology has been established to ensure objectivity where possible.
- 14.12 With respect to the relevant guidance this LVIA has been carried out with reference to the processes outlined in the following accepted industry publications:
- Landscape Character Assessment: Guidance for England and Scotland, (LCA), Countryside Agency, (now Natural England), 2001;
 - Guidelines for Landscape and Visual Impact Assessment, (GLVIA), The Landscape Institute and Institute for Environmental Management and Assessment, 2nd Edition, 2002; and
 - Landscape Institute Advice Note 01/09 Use of photography and photomontage in landscape and visual assessment.

- 14.13 This LVIA has been undertaken through desk studies which have reviewed written data and maps of the local study area. Field work has also been undertaken to supplement the available desk sources and gain an understanding of the existing landscape character and visual amenity, particularly at a local scale. The field work was undertaken between January and April 2011 to aid in understanding the seasonal variations in the local landscape. Photographs taken in Winter are representative of the site. Locations of these views are broadly similar to Summer views and demonstrate the general difference in Site appearance.
- 14.14 The LVIA has been carried out in a consistent manner to the criteria and method outlined in Chapter 2.
- 14.15 This LVIA is based upon the following:
- The baseline context of the existing landscape character and visibility of the local study area, including a review of the night-time context, and the Site;
 - Identifying the receptors and their sensitivity;
 - Identifying the potential sources of effect and magnitude as outlined in Chapter 2;
 - Outlining the primary mitigation measures, (i.e. those incorporated into the Proposed Development);
 - Identifying the likely significant effects of the Proposed Development;
 - Recommending additional mitigation measures proposed to reduce, remedy or compensate for those impacts identified, (particularly if considered significant), including those within the design to minimise impacts, (secondary mitigation measures); and
 - Providing an assessment of the nature and level of landscape and visual impact, including a qualitative lighting appraisal, expressed as an impact threshold.

Baseline Conditions

- 14.16 This section outlines the existing landscape character for the wider regional and local landscape highlighting the aspects of the landscape in the wider area of relevance to the Site and potentially to the development of the masterplan. It also considers the Site to identify the key landscape receptors and assign environmental value with reference to previous assessment work.

Landscape and Townscape Character

- 14.17 Existing studies of the national, regional and local landscape character, issues and management guidelines studies are referred to in Table 14.2, Summary of Relevant Landscape Planning Issues.

Regional

- 14.18 The regional study area incorporates a mix of urban settlements and agricultural landscape, with large areas of woodland and heathland across flat and gently sloping topographical change. The South Downs National Park to the north and the Chichester Harbour Area of Outstanding Natural Beauty to the south have more exaggerated and extreme landscapes with a series of undulating hills of open countryside and flat, open coastal plains respectively. The Site is not visible from and not part of the setting of the South Downs National Park or Chichester Harbour Area of Outstanding Natural Beauty.
- 14.19 The main city and employment centre is Portsmouth on the south coast, with Waterlooville and Havant providing the main urban settlements inland. Smaller settlements and villages are scattered away from the main settlements following the local road patterns.

- 14.20 The main infrastructure is along the north to south A3 (M) connecting London with Portsmouth. Running east to west to the south of the Site is the M27 and A27, connecting Southampton, Portsmouth and Chichester.

Local

- 14.21 The study area is dominated by the A3 (M) road corridor with the large settlements of Waterlooville running along the western border and Leigh Park approximately 600m to the east. The A3 (M) road corridor is cut into the landscape and further concealed by mature and densely planted embankments restricting any distant views of the road or out to the local area. At junction 3 there are some local views from the elevated roundabout. Between the A3 (M) and the western settlement boundary of Leigh Park are a series of agricultural fields divided by mature hedgerows with copses of woodland.
- 14.22 The borders of Waterlooville are largely contained and not visible due to the mature embankment vegetation along the A3 (M). The western side of Leigh Park is topographically lower and the borders are wooded restricting any views. The housing of Leigh Park is predominantly brown and red brick 1960s, built as public housing stock, low to medium rise terraces and apartments with plain utilitarian commonality of design and limited architectural expression.
- 14.23 The local infrastructure is concentrated on the local roads across the A3 (M) at Junctions 3 and 4. The roads of Waterlooville and Leigh Park are a series of residential cul de sacs connected by residential streets.
- 14.24 Hermitage Stream runs from north to south, emerging on site from a culvert running east – west under the A3, and continues in a south easterly direction through Leigh Park and further south on through Stockheath, eventually meeting Storehouse Lake to the south of the A27.

The Site

- 14.25 The Site gently rises from 20 metres AOD in the south to approximately 45 metres AOD in the north. The site falls away to the east down towards the wooded enclosures around Hermitage Stream and down in the south west towards the A3 (M) embankment. An exposed high point or ridgeline coincides along Park Lane Bridleway 123. Land to the east, adjacent to Calshot Road and Prospect School is open, levelling out to the Leigh Park area at circa 15m AOD.
- 14.26 The principle urban features are the western settlement edge of Leigh Park and a large pylon with overhead cables running north to south across the Site. The A3(M), although not directly visible, can be heard and it becomes visible with a more audible presence at the raised roundabout at Junction 3.
- 14.27 There are dense areas of vegetation to the south of the Site. The northern part of the Site is more open and the woodland within the Site connects with the field boundaries. The Site is predominantly made up of arable fields and pasture enclosed by mature hedgerows and wooded copses. There are lower and broken, diminishing hedgerows on the higher ground towards the centre of the Site where the field sizes also become larger scale.
- 14.28 Hermitage Stream runs along the eastern border of the Site and continues round to the south of the Site following a wooded corridor towards and under Junction 3 of the A3 (M). Park Lane Stream is contained within Bell's copse on the eastern side of the Site with the adjacent field sloping down towards it.
- 14.29 The Arboriculturist report (Appendix 14.1) details the condition of trees close to the proposed link road, and an assessment of the existing vegetation and prominent trees within the wider masterplan area.
- 14.30 The higher ground to the north of the Site affords medium distant views to the south along the A3 (M) corridor. The elevated northern part of the Site that is adjacent to Park Lane is laid to aggregate without formal footpaths alongside and is more of a track in appearance and use. There

are some views from the properties at the corner of Calshot Road that openly overlook part of the Site.

- 14.31 Park Lane and adjoining designated and informal footpaths are popular with local walkers and cyclists. Park Lane connects across the A3 (M) to Waterloooville and is an important local route.

Key Landscape and Townscape Features and Receptors

- 14.32 The key landscape features and the zones of local landscape character have been identified within the study area, from the site visit and the findings reflect and develop the published assessments outlined in Table 14.1. At the local scale, the landscape around the site was analysed and broken into zones of broadly homogenous character refer to Figure 14.2, Landscape Character:

1. Urban – this zone includes the urban areas of Waterloooville and Leigh Park, to the west and east of the motorway respectively. Both these areas are reasonably well screened by maturing vegetation in views from the motorway corridor. The eastern settlement edge of Waterloooville runs along the western side of the A3 (M) and is largely contained from the Site by both the A3 (M) corridor and the dense planting around it. The western settlement edge of Leigh Park runs along eastern edge of Site boundary. Garden fences, hedgerows and the rear of properties front onto the Site. The environmental value of the urban areas can be described of as 'Low or Medium' importance and rarity, in terms of its character or architectural quality, as it is generally locally typical typology or style without notable listed buildings or landmarks.
2. Woodland – this is an area of mature, deciduous woodland to the north and east of the Site. To the north east it extends into the large wooded area to the north of Staunton Country Park, and to the west of the Site it links with the wooded area of The Warren. It is by its nature an enclosed landscape, and is important as a backdrop to the neighbouring, more open zones. Woodland areas, namely, Bushy Lease and Beech Wood possess characteristics associated with assorted pre-1810 woodland parcels, formerly part of the Forest of Bere. The environmental quality of this zone can be described as 'High or Medium' importance and rarity, at a regional scale with limited potential to replace if lost. These areas of woodland and other more recent woodland are described further:
 - Bushy Lease runs along the southern side of Hermitage Stream to the south of the Site. Bushy Lease is physically separated from the Site and has no direct relation;
 - Bell's Copse runs along the north eastern edge of the Site connecting through into Leigh Park. The woodland edge overlooks the eastern side of the Site that slopes down towards it;
 - Beech Wood runs along the western boundary of the Site separating the A3 (M) and the site. The small wooded area runs along an embankment; and
 - Johnstone's Coppice is to the far south west of the Site along the western side of the A3 (M) with no direct relation to the Site.

Parts of the woodland require management to improve their quality and improve the appearance. Additionally the watercourse of Hermitage Stream is concealed by woodland cover. Access to the woodland is limited to unmaintained informal routes.

3. A3 (M) Corridor – this zone lies alongside the motorway and is strongly affected visually by it. The motorway is mostly in cutting, bordering the western site boundary and the area affected is relatively narrow, but it does act as a break between the wider areas to the east and west and is clearly different in character from them. Junction 3 of the A3 (M) is elevated and more visible from the Site and surrounding residential areas. Steep embankments and mature vegetation line and contain both sides of the road. These open up over the Site at the raised junction roundabout. It is possible to assign an environmental value of 'Low or Medium' importance or rarity, at the local scale.

4. Sloping Arable Land – this zone is roughly coincident with the Site boundary, and includes all the area that would be developed as a result of the proposals. It has an open character, in contrast to the more wooded areas, which surround it, and slopes from north to south. Its openness is limited by some mature trees within the hedgerow and also by the hedges themselves, and it is also affected by the urban influences of the surrounding housing, which can be glimpsed in places, and also by the motorway, which can be heard when it cannot be seen. This zone also has a slightly degraded, urban fringe character, particularly along Park Lane, where signs of urban use and abuse are frequent. The area is crossed by a high voltage electricity transmission line running roughly north – south, carried on pylons which are visually dominant, and also by two low voltage lines, one running parallel to the pylons, and the other crossing the site to pass through Beech Wood. It is also an area subject to fly tipping along the fringes adjoining Leigh Park and the parcels immediately adjoining the residential area are degraded in parts. Overall the fields are key to the strategic gap and are generally well maintained and can be assigned an environmental value of ‘High or Medium’ importance and rarity, with relevance to the regional area with limited potential for substitution.
5. Undulating Mixed Grassland and Woodland - this is a complex area of undulating topography comprising a patchwork of small to medium sized woodland blocks and open areas of rough grassland or pasture. It contains a number of potentially intrusive features including the motorway and the overhead electricity transmission line which continues from zone 4, but is able to contain these features such that in many views the area appears to be relatively unspoilt and rural. It is generally well screened from the adjoining urban areas to the east and west. This area of land is quite contained with limited influence from the A3 (M) and given its proximity to Havant, represents a natural amenity. Therefore it is possible to assign an environmental value of ‘High or Medium’ importance and rarity, of regional importance and possessing limited potential for substitution.
6. Water courses – including Hermitage Stream which is contained within and flows through a series of wooded copses to the south of the Site on the northern edge of Neville’s Park. The stream crosses the south eastern corner of the Site and flows through a culvert under the A3 (M). Park Lane Stream, a tributary to Hermitage Stream runs north-south along the north eastern edge of the Site.

Visual Amenity

- 14.33 The existing visual context of the Site has been reviewed and a theoretical zone of visual influence established, (ZVI). This has been based on the local topography and refined onsite by intervisibility studies.

General Views

From the North

- 14.34 There are no long distance views from the north. Views are restricted by the A3 (M) road corridor, embankments and associated mature planting. The woodland following Hermitage Stream and the slope of the Site restricts any open views from the north east. Residential properties to the north eastern edge of Waterloooville and to the north of the A3(M) were considered as possibly having oblique views of the most northerly part of the Site. The landscape associated with this development, estimated to planted in the late 1980s and early 90s, has matured over the past decade and it is considered that effects upon views from these properties would be none or negligible. They have been ruled out from the assessment on this basis.
- 14.35 There are some close range views into the Site from bridleway No. 123, Park Lane which is well used and continues across the Site. There is a view from Park Lane where it crosses the A3 (M) on an elevated footbridge.

From the East

- 14.36 There are no long distance views from the east. Views are restricted by the northern residential area of Havant known as Leigh Park. To the north east the dense woodland along Hermitage Stream restrict views.
- 14.37 There are some close range filtered and open views afforded from the east from the properties along Ramsdale Avenue. These views are filtered by the mature planting along Park Lane and around the borders of Prospect School or open due to the views from the junction of Park Lane with Ramsdale Avenue and the opening in the adjacent field. There may be glimpse or oblique views of the most southerly part of the Site through the mature tree belts from properties within the newly constructed development at Woolston Road.

From the South

- 14.38 Views are restricted by the A3 (M) road corridor, embankments and associated mature planting, the residential development of Leigh Park, Havant and the mature wooded copses and hedgerows in and around Neville's Park. It is considered that the Site and Proposed Development would not be clearly visible from properties at Camp Down, 2 km from the Site, although the pylon lines can be seen.
- 14.39 There are limited close range views from the south. For the most part these are restricted by the wooded vegetation belt around Neville's Park. There are filtered views directly adjacent to the application site from footpath No. 508, looking over and through mature hedgerows and wooded copses.

From the West

- 14.40 There are no long distance views from the west. Views are restricted by the A3 (M) road corridor, embankments and associated mature planting.
- 14.41 Close range views from the west are largely restricted by the A3 (M) road corridor, embankment and associated mature planting. There are views across the Site from the Junction 3 roundabout from passing vehicles. There are no views into the Site from Waterlooville on the western side of the A3 (M).

Potential Visual Receptors and Key Representative Viewpoints

- 14.42 Potential visual receptors within the study area have been identified and are described below. Photographs are included for a number of key representative viewpoints identified on Figure 14.3 and photographic views detailed on Figures 14.4 to 14.10 inclusively. The establishment of the receptor type and sensitivity is defined from consideration of the methodology derived from the GLVIA.
- 14.43 A number of key viewpoints and receptor groups have been selected which are considered to typify the existing visual context. These are summarised below in Table 14.3 with full descriptions in Table 14.5.
- 14.44 Potential Visual Receptors groups within the study area include:

Residential Properties

- 14.45 The residential properties on the western edge of the Leigh Park residential area have glimpsed views into the Site. The properties are typical two storey post war red brick terraced along Ramsdale Avenue and 3 - 4 storey small blocks of flats and Calshot Road. Additionally there may also be a glimpse or oblique views from properties within the recently constructed Woolston Road development. Boundary fence lines, trees, and hedgerows restrict open views.

Footpaths

- 14.46 There are a series of Public Rights of Ways around the borders of the Site. The footpaths tend to follow field boundaries with mature hedgerows and wooded copses. Views from outside of the Site are restricted by the mature vegetation cover.

Bridleways

- 14.47 Park Lane Bridleway connects Leigh Park across the A3 (M) to Waterlooville and is an important local route. The bridleway crosses the Site with hedgerows along both sides. The hedgerow in areas has gaps or has lost the shrub species with low level scrub or bramble colonising, allowing views over. In other areas they are mature and further enforced with hedgerow trees species. There are views across large segments of the Site from the bridleway within the Site. Views from the bridleway outside of the Site are restricted by the dense vegetation cover.

Open Space

- 14.48 Neville's Park, Staunton Country Park, South Down's National Park and Portsmouth Golf Club are areas of open space. Due to the proximity to the A3 (M) corridor, the heavy vegetation cover and undulating topography there are no direct views into the Site from the National Park or Golf Club. Within the study area:

- Cabbagefield Row is to the east of the Site and Hermitage Stream. Bell's Copse and the rising topography separates the area from the Site;
- Neville's Park is on the southern side of the Site largely separated by a dense copse of woodland. The park leads into the south western stretch of Leigh Park; and
- Staunton Country Park is to the north east of the Site separated by Hermitage Stream, Bell's Copse and the undulating topography. There are no views from Staunton Country Park.

Roads

- 14.49 The A3(M) is generally screened from the Site with mature vegetation along the embankments. There are potential views from Junction 3 which is an elevated roundabout, however there is limited opportunity to stop from the most elevated parts of the junction and pedestrian access is not provided. Hulbert Road is also semi enclosed with limited views across the northern part of the Site from the elevated section that joins Junction 3 of the A3 (M). Further south, where Hulbert Road is at grade and enclosed by substantial woodland, there are no views of the whole Site and glimpses of the corridor of the proposed link road.
- 14.50 Based on the site visits it is considered that the main receptors with either open views or in close proximity to the Site are from Park Lane, Calshot Road, Ramsdale Road, Hermitage Stream and the vehicular over bridge at Junction 3.

Other Uses

- 14.51 Prospect School borders the Site and it is possible that there may be winter views. However, at the time of assessment it was not possible to obtain access to this Site.

Table 14.3 - Representative Viewpoints from Visual Receptors and Sensitivity

Viewpoint	Location	Type	Sensitivity
Residential			
2	Rear of properties on Ramsdale Road	Residential	Medium
3	Rear of properties on Ramsdale Road	Residential	Medium
Footpaths			
1	Footpath 508 beside Hermitage Stream	Footpath	Medium

Viewpoint	Location	Type	Sensitivity
4	Footpath 508 along southern boundary of application site	Footpath	Low
5	Footpath 508 on northern side	Footpath	Low
6	Footpath 508 on northern side	Footpath	Low
7	Junction of Bridleway 123, Footpath 503 and properties on Calshot Road	Footpath/ Residential	Low
12	Footpath 120	Footpath	Low
13	Footpath 120	Footpath	Low
Bridleway			
8	Bridleway 123	Bridleway	Low
9	Bridleway 123	Bridleway	Low
10	Bridleway 123	Bridleway	Low

Existing Lighting at Night

- 14.52 There is currently no lighting on the Site or along the A3(M). There is street lighting associated with the Leigh Park area which is typical of the settlement edge and reflects the urban qualities of the urban character zone.

Summary of Views

- 14.53 The potential visual receptors of the Proposed Development that have open views of the Site or are in close proximity to the Site include Park Lane, Calshot Road, Ramsdale Road, Hermitage Stream and the vehicular over bridge at Junction 3.

Identification and Assessment of Likely Significant Effects

- 14.54 The LVIA has been considered for the phased construction and operational phases, 15 years following completion of Phase 2. The sources of impact are likely to occur from:

Construction Phase

- Phased site clearance;
- General construction activities over an extended period of time in response to a phased development;
- Site compound with storage of materials;
- Temporary hoardings;
- Temporary lighting; and
- On and off site construction traffic.

Operation

- New building;
- New hardstanding and internal road network;
- New landscape scheme;
- Operational activity within a largely formerly unused site;
- New perimeter fencing; and
- New operational lighting.

Potential Landscape Effects

- 14.55 A number of key issues which may affect the existing landscape context have been identified in accordance with the methodology derived from the GLVIA and summarised below.

Changes to Local Landscape Character

Regional Scale

- 14.56 It is considered that the potential effect at a regional scale will be **negligible** given the enclosed location of the Site and its low lying position within the landscape.

Local Scale

- 14.57 At a local scale the potential effect is considered to be **moderate adverse**. The location of the Site, adjacent to the A3(M) corridor and the development edge of Leigh Park and the large pylons running across the Site provide an existing urban influence that detracts from the otherwise semi rural nature of the Site. The moderate adverse effect would be through the introduction of buildings into agricultural fields.

The Site

- 14.58 The field work established that the Site is within Local Character Area 11. The potential effect is considered to be **minor adverse** as the implementation of the Proposed Development will be a perceptible change. The buildings will be of a higher architectural quality compared to those in the local area and the height would be no greater than buildings in the local area. The existing and proposed planting would screen the buildings and enhance the area and would be in line with the objectives for LCA11 to create 'a strong wooded character to any new areas of development.'

Changes to Public Rights of Way

- 14.59 No diversion or temporary closure to existing PRoWs are considered necessary as a result of the Proposed Development and therefore the effect is **negligible**.

Disturbance to Existing Vegetation

- 14.60 There will be loss of approximately eight to ten large oak/ash trees along the alignment of the proposed link road to the immediate north of the new access with Hulbert Road. In addition there will be a loss of approximately 90 trees in total, as summarised in section 5.4 or the Arboricultural Report which accompanies this application. These are trees lost as a result of the Link Road and those recommended for removal due to their poor condition. A considerable proportion of the species mix is Aspen of fair to poor condition.
- 14.61 Alternative route alignments of the link road have been considered but are not feasible in terms of the highway design. The mitigation planting would result in a **minor adverse effect**, given the maturity and stature of the existing trees. Mitigating measures will comprise proposals which will replant semi-mature oak trees to compensate for their loss. Detail design around significant trees to be retained of Category 'A or B' condition should seek to develop 'No Dig' design solutions within affected root zones.

Potential Visual Impacts

- 14.62 A number of key aspects have been identified with a description of the works and effects outlined in Table 14.5. This has been undertaken in accordance with reference to the GLVIA.

Regional

Effects to Chichester Harbour AONB Visual Amenities

- 14.63 There are no views into the Site from within the Chichester Harbour AONB. Accordingly, it will not be possible to see the Site at night. The setting of the park will not be compromised due to the proximity of the site to the A3(M) and the existing mature vegetation cover and the proposed

screen planting. Therefore the potential effect on Chichester Harbour AONB is considered **negligible**.

Effects to South Downs National Park Visual Amenity

- 14.64 There are no views into the Site from within the South Downs national park. The setting of the park will not be compromised due to the proximity of the Site to the A3(M), the existing mature vegetation cover and the proposed screen planting. Therefore the potential effect on the South Downs National Park is considered **negligible**. Night time views will not be affected.

Local

Construction Phase

- 14.65 Overall, the potential effects are considered to range between **moderate adverse and negligible** for the identified receptors.
- 14.66 The potential for **moderate adverse effects** are for receptors in close proximity to the Site, for whom views will be open and filtered. This relates specifically to Footpaths 508, 120, 503 and Park Lane/Bridleway 123 receptors directly adjacent to or through the Site. Properties along Ramsdale Avenue, particularly at the junction with Park Lane/Bridleway 123 will also have open views into the Site.
- 14.67 At distance from the Site, its low lying position within the landscape, in conjunction with the existing mature boundary vegetation, changes in localised topography, the raised embankments along the A3 (M) and the agricultural field boundaries are considered to screen the Proposed Development, resulting in **negligible effects**.

Operational Phase

- 14.68 Overall the potential for effects are considered to range between **moderate adverse and minor beneficial** for the identified receptors.
- 14.69 The potential for moderate adverse effects are for receptors in close proximity to the Site, for whom the massing and scale of the Scheme will result in perceptible change to existing views, specifically for receptors:
- Footpath 508;
 - Bridleway 123 - Park Lane;
 - Junction of Bridleway 123, Footpath 503 and Calshot Road; and
 - Properties on Calshot Road.
- 14.70 These views will all be at close range. Existing vegetation and proposed planting will mitigate these views and integrate the development into the existing landscape. The proposal to introduce additional native planting is seen as minor beneficial to the receptors within close proximity whose views are currently dominated by the pylons.
- 14.71 At distance from the Site, its low lying position within the landscape, in conjunction with the existing mature boundary vegetation, changes in localised topography, the raised embankments along the A3 (M) and the agricultural field boundaries are considered to screen the Proposed Development, resulting in negligible effects.

Night Time Effects from Lighting

- 14.72 The Proposed Development will require lighting along its transport infrastructure routes, building fronts and internally for the buildings. The Site is largely contained but there are some views from local footpaths, bridleways, junction 3 of the A3 (M) and glimpsed views from the western settlement edge of Leigh Park that would be affected by lighting proposals. It is considered the low level of intrusion the lighting would cause would create a **minor adverse effect**.

- 14.73 The effects of the lighting can be mitigated through carrying out a detailed lighting survey, minimising light spillage through, selective positioning of street lights, building design and screen planting.

Additional Mitigation Measures

Mitigation

- 14.74 With regard to the short term mitigation, the following measures are proposed:

- All works in proximity to existing vegetation be undertaken in accordance with BS5837:2005 Trees in Relation to Construction;
- Early or advanced planting of new landscape structure;
- Early improvements to Park Lane, which has an unbound finish;
- Minimisation of the works area;
- Site to be clear from litter and general debris; and
- Reinforce the edges of existing woodland or hedgerows to further define the structure and also meet ecological objectives.

Residual Effects

- 14.75 These are set out in Table 14.4 below.

Cumulative Effects

- 14.76 It is considered that potential cumulative effects are limited and therefore of **negligible effect**, as the two phases of development will be implemented in tandem. New infrastructure alignments, specifically to the road network, are considered to be beneficial to the layout and form within the Site. There are no other relevant permitted developments within the immediate vicinity of the Site.
- 14.77 The phased works will result in landscape management implementation, which will soften the edges of the Site and integrate the Proposed Development within the wider landscape. This is considered to be a **negligible effect** in the short term and **minor beneficial** in the long term.
- 14.78 Views towards the Site from the identified visual receptors will change considerably. The masterplan proposals will introduce new buildings and infrastructure to agricultural land across the Site. These will be integrated with the existing mature vegetation and the proposed planting and respond to the slight topographical change across the Site. Therefore it is considered there would be a **moderate adverse effect** in the short term and a **minor adverse effect** in the long term.
- 14.79 New buildings and infrastructure will increase the amount of lighting from areas currently unlit within Site. This is considered to increase both the ambient lighting and sky glow from the DGTP and more generally LCA11. This is considered to be a **minor adverse effect**.

Summary

Landscape Effects

- 14.80 From a wider perspective the effects upon the landscape and other designations can be described as follows:
- No effect upon the South Downs National Park or the Chichester AONB, as the Site falls within the South Hampshire Lowlands (NCA 128) and sits within the settlement context of Waterlooville or Havant and not the more open land to the north which falls with the associated South Downs NCA,125;

- Localised impact upon the landscape character of the land within the Strategic Gap, with retention of the strong existing pattern of woodland compartments. The proposals do provide opportunity to reinforce woodland, particularly boundary planting, helping to mitigate the effects with careful location of proposed buildings within an overarching landscape structure;
- Minimal impact upon the wider landscape character areas LCAs and NCA;
- Impact upon site vegetation would be limited with the majority of vegetation retained and reinforced as part of the proposed landscape structure with the exception of the loss of the mature oak/ash trees along the proposed alignment of the link road to the immediate north of its junction with Hulbert Road. Localised mitigation measures could be employed such as 'No Dig Design Solutions' for trees which are located at the edge of the Link Road corridor;
- Impact upon the footpath network could be mitigated by providing footpaths and additional east-west connections, within the Site itself, encouraging walking;
- Watercourses, specifically Hermitage Stream, could be improved with retired banks and decanalised appearance. Woodland cover should be managed to diversify the habitat, improve accessibility and potentially to create a north-south walk via Neville's Park; and
- Local environmental improvements could provide benefit to the wider Leigh Park especially on the eastern boundary of the Site; measures could include improvements to open space and management of spaces used for recreational purposes.

14.81 Overall, the impact upon the landscape of the Site is considered to be **minor to moderate adverse**, reducing to minor adverse with time, as the link road and development are integrated into the existing established landscape by the new landscape structure.

Visual Effects

14.82 Views to and from the Site are contained, limiting the visual influence of the Site and any associated impact upon the receptors identified. Those visual effects which are key to consider include:

- Views from the properties identified adjoining the Site, principally Calshott Road and Ramsdale Road, to identify adequate screening adjoining the Site and within the Site between the development parcels, particularly to screen any glimpse or oblique views from more distant views such as properties at the new Woolston Road development;
- Views of different parts of the Site from Bridleway 123 which will be close to development parcels and the views would change substantially. The development will need to consider how this route can be integrated and devise means of mitigating the visual effects. For example considering the potential for a new visual framework as part of the built form within the masterplan; and
- Limited visibility of elevated parts of the Site, as illustrated in Figure 14.4 to 14.11 inclusively will need to be carefully considered in terms of the overall height of rooflines to avoid visual impact above tree canopies.

14.83 Overall, the impact upon the existing views is considered to be **minor to moderate adverse**, reducing to **minor adverse** with time, with the establishment of the structural landscape.

Table 14.4 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Construction of Link Road and built form of masterplan visible from existing footpaths and bridleway, most notably No123, and from dwellings on Calshot Road, Ramsdale Road and the Woolston Road development.	Screen planting within the Site will integrate the new buildings into the existing views. Rooflines should be below the tree line and reduced for Phase 2 for elevated parts of the site.	Minor adverse effect.
Minor loss of vegetation and impact upon the character of the landscape	Integration of the proposed built form with new landscape structure comprising a series of green fingers combined strengthening of the existing landscape structure.	Negligible effect.
Loss of mature Oak/Ash trees	Replant with semi-mature oak/ash specimens as part of the wider landscape.	Minor adverse effect.
Construction of Link road across Hermitage Stream	Decanalising of channel will create a more natural appearance.	Moderate beneficial effect.
Operation		
Site traffic and activity associated with Link Road	Integration of site circulation within site wide landscape structure.	Minor adverse effect.
Activity associated with built form, most notably distribution uses	Mitigating screen planting to southerly boundaries of site will reduce impact combined with co-location of building to screen car park areas beyond.	Minor adverse effect.

Table 14.5 - Summary of Effects of View Points

Receptor No	Location	Type	Distance metres (approx)	Direction of View	Sensitivity	Existing View	Impacts	Construction effect	Operation Effect – Year One	Operational Effect - Year 15
1	Footpath 508 beside Hermitage Stream, Nevilles Park	Footpath	250m	North at grade	Medium	Across open grassland with a wooded border following Hermitage Stream. There are no direct views into the Site.	Views of Proposed Development are restricted by a mature woodland belt. There could be glimpsed views of HGV and other construction elements in motion and any works carried out above the tree line. Minor impact as the Proposed Development will not be directly visible.	Slight Adverse as close range views will be restricted by the mature woodland belt. There could be some views of cranes over the tree line.	Slight adverse as the existing vegetation would screen direct views into the application site. During winter months there could be glimpsed views of the new development.	Slight adverse as the existing vegetation would screen direct views into the Site and proposed planting would further screen these areas. During winter months there could be glimpsed views of the new development.
2	Rear of properties on Ramsdale Road	Residential	150m	North west	Medium	Across open grassland with a wooded border following Hermitage Stream. There are no direct views into the Site.	Views of Proposed Development are restricted by a mature woodland belt. There could be glimpsed views of HGV and other construction elements in motion and any works carried out above the tree line. Minor impact as the Proposed Development will not be directly visible.	Minor adverse as close range views will be restricted by the mature woodland belt. There could be some views of cranes over the tree line.	Slight adverse as the existing vegetation would screen direct views into the Site. During winter months there could be glimpsed views of the new development.	Slight adverse as the existing vegetation would screen direct views into the Site and proposed planting would further screen these areas. During winter months there could be glimpsed views of the new development.
3	Rear of properties on Ramsdale Road	Residential	150m	South west	Medium	Across open grassland with a wooded border following Hermitage Stream. There are no direct views into the Site.	Views of Proposed Development are restricted by a mature woodland belt. There could be glimpsed views of HGV and other construction elements in motion and any works carried out above the tree line. Minor impact as the Proposed Development will not be directly visible.	Minor adverse as close range views will be restricted by the mature woodland belt. There could be some views of cranes over the tree line.	Slight adverse as the existing vegetation would screen direct views into the Site. During winter months there could be glimpsed views of the new development.	Slight adverse as the existing vegetation would screen direct views into the Site and proposed planting would further screen these areas. During winter months there could be glimpsed views of the new development.
4	Footpath 508 along southern boundary of Site	Footpath	Within 10m of Site	North west looking up a gentle	Low	There are filtered views through and over the mature boundary hedgerow with areas of woodland cover. The view is of an open arable field enclosed by hedgerows with large pylons across the eastern field boundary running north to south.	Due to the close proximity of the application site and the sparse nature of the hedgerow in places there are clear views into this part of the site. These views would be contained by the existing mature hedgerows across the Site. Moderate adverse impact as the proposed development would be clearly visible.	Slight adverse as the construction works would be visible from this close proximity to the site but partly screened by the boundary planting.	Slight adverse as the Proposed Development will be viewed through and over the existing boundary planting.	Slight adverse as the Proposed Development will be viewed through and over the existing boundary planting.
5	Footpath 508 along southern boundary of Site	Footpath	Within 10m of Site	North west looking up a gentle slope	Low	There are filtered views through the mature wooded border. The view is of an open arable field enclosed by mature hedgerow with a series of large pylons running along the eastern field boundary.	Due to the close proximity of the Site and the low lying ground vegetation there would be clear and filtered views into this part of the Site. These views would be contained by the existing mature hedgerows across the Site.	Slight adverse as the construction works would be visible from this close proximity to the Site but partly screened by the boundary planting.	Slight adverse as the Proposed Development will be viewed through and over the existing boundary planting.	Slight adverse as the Proposed Development will be viewed through and over the existing boundary planting.

Receptor No	Location	Type	Distance metres (approx)	Direction of View	Sensitivity	Existing View	Impacts	Construction effect	Operation Effect – Year One	Operational Effect - Year 15
							Moderate adverse impact as the Proposed Development would be clearly visible.			
6	Footpath 508 on southern boundary of Site	Footpath	Within 10m of Site	North west looking up a gentle slope	Low	There are open views through the mature wooded border. The view is of a large open pastoral field that slopes gently to the north.	Due to the close proximity of the Site and the low lying ground vegetation there would be clear views into this part of the Site. These views would be contained by the mature wooded belt to the east and the hedgerows in the far north. Moderate adverse impact as the Proposed Development would be clearly visible.	Slight adverse as the construction works would be visible from this close proximity to the Site but partly screened by the boundary planting.	Slight adverse as the Proposed Development will be viewed through the existing wooded border.	Slight adverse as the Proposed Development will be viewed through the existing wooded border.
7	Junction of Bridleway 123, Footpath 503 and properties on Calshot Road	Footpath	0m from within the Site	West looking down a gentle slope	Low	There are open views from an elevated position looking to the west. The view is across two open fields divided by mature hedgerow sloping gently north to south and east to west down towards the heavily vegetated A3(M). Large pylons run across the site. There is a wooded copse to the south and Bridleway 123 leads away to the north.	Due to being located within the Site, the elevated position and the current lack of planted screening there would be clear views across much of northern part of the Site. These views would be contained by the mature wooded belt along the A3(M) to the west and broken by the existing hedgerow across the Site. Moderate adverse impact as the Proposed Development would be clearly visible.	Slight adverse as the construction works would be fully visible from this elevated position within close proximity to the Site.	Slight adverse as the Proposed Development would be visible from this elevated position within close proximity to the site but would be partially screened by the proposed planting.	Slight adverse as the Proposed Development would be visible from this elevated position within close proximity to the Site but would be screened by the proposed planting.
8	Bridleway 123	Bridleway	0m from within the Site	West looking down a gentle slope	Low	There are filtered views from an elevated position looking west. The view is dominated by the large pylons crossing the Site over arable fields sloping gently away to the west, towards the heavily vegetated A3(M).	Due to being located within the Site and the elevated position there would be clear views across the Site. These views would be contained by the mature wooded belt along the A3(M) to the west and partly screened by the hedgerow alongside the bridleway. Minor adverse impact as the Proposed Development would be clearly visible. The presence of the existing large pylons detract from the Site.	Slight adverse as the construction works would be fully visible from this elevated position within close proximity to the Site.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site but would be partially screened by the proposed planting and would fit with urban influence of the large pylons.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site but would be screened by the proposed planting and would fit with urban influence of the large pylons.
9	Bridleway 123	Bridleway	0m from within the Site	West looking down a gently slope	Low	There are filtered views from an elevated position looking west. The view is across large arable fields sloping gently away to the west, towards the heavily vegetated A3(M). There are large overhead pylons and hedgerows that run across the Site.	Due to being located within the Site and the elevated position there would be clear views across a large part of the Site. These views would be contained by the mature wooded belt along the A3(M) to the west and partly screened by the hedgerow alongside the bridleway.	Slight adverse as the construction works would be fully visible from this elevated position within the Site.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site but would be partially screened by the proposed planting and would fit with urban influence of the large pylons.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site but would be partially screened by the proposed planting and would fit with urban influence of the large pylons.

Receptor No	Location	Type	Distance metres (approx)	Direction of View	Sensitivity	Existing View	Impacts	Construction effect	Operation Effect – Year One	Operational Effect - Year 15
							Minor adverse impact as the Proposed Development would be clearly visible. The presence of the existing large pylons detract from the site.			
10	Bridleway 123	Bridleway	0m from within the Site	South looking down a gentle slope	Low	There are open views across the Site from this elevated position looking south. The view is across large arable fields separated by mature hedgerows with large pylons running from north east to south west across the site. The heavily vegetated A3 (M) encloses the site from the west. This is the highest point on the Site.	Due to being located within the Site and the elevated position there would be clear views across a large part of the Site. These views would be contained by the mature wooded belt along the A3(M) to the west and partly screened by the hedgerow alongside the bridleway. Major Impact as the Proposed Development would be on the most elevated part of the Site and would be clearly visible.	Moderate adverse as the construction works would be fully visible from this elevated position within the Site.	Moderate adverse as the Proposed Development would be visible from this elevated position within the Site.	Moderate adverse as the Proposed Development would be visible from this elevated position within the Site. The screening planting would have matured and partially restrict the view.
11	Junction of Bridleway 123 and Footpath 120	Bridleway/ Footpath	Within 10m of Site	South east looking down a slope	Low	There are open views across the Site from this elevated position looking south east. The view is across an enclosed arable field that falls away down towards the wooded borders of Hermitage Stream in the east and the edge of the residential area of Leigh Park further south.	Due to being located within the Site and the elevated position there would be clear views across this part of the Site. These views would be contained by the mature wooded belt along Hermitage Stream to the east and enclosed by the hedgerow that follows the bridleway and southern field boundary. Moderate Impact as the Proposed Development would be on an enclosed part of the site which slopes away but would be visible from the bridleway and footpath.	Slight adverse as the construction works would be fully visible from this elevated position within the Site.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site. The screening planting will have matured and restrict the views.
12	Footpath 120	Footpath	0m from within the Site	South looking across a slope	Low	There are open views across the Site from this elevated position looking south. The view is across an enclosed arable field that falls away down towards the wooded borders of Hermitage Stream in the east and the edge of the residential area of Leigh Park further south.	Due to being located within the Site and the elevated position there would be clear views across this part of the Site. These views would be contained by the mature wooded belt along Hermitage Stream to the east and enclosed by the hedgerow that follows the bridleway and southern field boundary. Moderate Impact as the Proposed Development would be on an enclosed part of the site which slopes away but would be visible from the bridleway and footpath.	Slight adverse as the construction works would be fully visible from this elevated position within the Site.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site. The screening planting will have matured and partially restrict the views.

Receptor No	Location	Type	Distance metres (approx)	Direction of View	Sensitivity	Existing View	Impacts	Construction effect	Operation Effect – Year One	Operational Effect - Year 15
13	Footpath 120	Footpath	0m from within the Site	South	Low	There are open views across the Site from this elevated position looking south. The view is across an enclosed arable field that falls away down towards the wooded borders of Hermitage Stream in the east and the edge of the residential area of Leigh Park further south.	Due to being located within the Site without any screening there would be clear views across the lower section of this part of the site. These views would be contained by the mature wooded belt along Hermitage Stream to the east and enclosed by the hedgerow that follows the bridleway and southern field boundary. Major Impact as the Proposed Development would be clearly visible.	Slight adverse as the construction works would be fully visible from this low position within the Site.	Slight adverse as the Proposed Development would be visible from this low position within the Site.	Slight adverse as the Proposed Development would be visible from this elevated position within the Site. The screening planting will have matured and partially restrict the views.
14	Bridleway 123 - Pedestrian bridge over A3(M)	Bridleway	250m	Looking south along A3(M) corridor	Negligible	There are no direct views of the Site from pedestrian bridge across the A3 (M). The view is along the A3 (M) corridor and the view into the site is restricted by the heavily vegetated embankments that rise up above the road.	There are no views into the Site. Negligible Impact as the Proposed Development would not be visible.	Neutral as the Site works would not be visible.	Neutral as the Proposed Development would not be visible from here.	Neutral as the Proposed Development would not be visible from here.
15	Properties at Woolston Road Development (Principally those upper storey flats within blocks numbered 31 to 35, 78 to 89, 109 to 116, 130 to 135 and houses which face onto the edge of the Site, numbers 20 to 25, 26 to 30).	Residential	150	North West	Medium	Potential views across open grassland and through any gaps within tree belt which will generally screen the most southerly development parcel intended as B8 use.	Views of Proposed Development are restricted by a mature woodland belt and interplanting. There could be glimpsed views of HGV and other construction elements in motion and any works carried out above the tree line. Minor impact as the Proposed Development will not be directly visible.	Minor adverse as close range views will be restricted by the mature woodland belt. There could be some views of cranes over the tree line.	Slight adverse as the existing vegetation would screen direct views into the Site. During winter months there could be glimpsed views of the Proposed Development.	Slight adverse as the existing vegetation would screen direct views into the Site and proposed planting would further screen these areas. During winter months there could be glimpsed views of the Proposed Development.
16	Portsmouth Golf Club	Recreation	2.5 miles	Looking north from elevated position from Portsmouth Golf Club	Medium	There are no direct views of the Site from the Golf Course. The view is across the borders of Waterlooville, the A3 (M) and Havant.	Due to the distance, the large areas of mature vegetation and the urban fringes of Waterlooville and Havant the site is not discernible. Negligible Impact as the Proposed Development would not be noticeable.	Neutral as the construction works would not be visible.	Neutral as the Proposed Development would not be visible.	Neutral as the Proposed Development would not be visible.

15 Ecology

Introduction

- 15.1 This chapter describes the existing ecological features and identifies key ecological effects associated with the Proposed Development. It also describes the mitigation and enhancement measures that are included within the design to minimise adverse effects on ecology and nature conservation resulting from the Proposed Development. Mitigation is taken into account in the assessment of the effects.
- 15.2 The following sections provide:
- A description of the method of survey and assessment;
 - A description of the existing ecological conditions;
 - An evaluation of the known ecological features within the study area in terms of their nature conservation value;
 - A description of the proposed mitigation strategy; and
 - An assessment of the overall significance of the residual effect of the Proposed Development.

Scoping Response

- 15.3 Ecology issues raised by respondents to the EIA Scoping Report are summarised in Table 15.1

Table 15.1 - Response - Ecology Issues

Issue Raised	Respondent
The development site is within 3.5km of the following designated nature conservation sites – Langstone Harbour Site of Special Scientific Interest (SSSI), Chichester and Langstone Harbours Special Protection Area (SPA/ Ramsar) and Solent Maritime Special Area of Conservation (SAC).	Simon Thompson, Natural England, Government Team (comment as at 15 March 2011 to the original Scoping Report).
The ES should include a full assessment of the direct and indirect effects of the development on the features of special interest within the site and should identify such mitigation measures as may be require in order to avoid, minimise, or reduce any adverse significant effects.	
It is recommended that there should be a separate section of the ES to address impacts on European and Ramsar sites entitled 'Information for Habitats Regulations Assessment'. This should include but not be limited to – impact of air pollution from increased traffic on European designated sites and potential changes in ground or surface water hydrological regime.	
The ES should include an assessment of the likely impacts on the wildlife interests of the local wildlife sites. The assessment should include proposals from mitigation of any impacts.	
The development site is within 3.5km of the following designated nature conservation sites – Langstone Harbour Site of Special Scientific Interest (SSSI), Chichester and Langstone Harbours Special Protection Area (SPA/ Ramsar) and Solent Maritime Special Area of Conservation (SAC).	

Issue Raised	Respondent
The ES should include a full assessment of the direct and indirect effects of the development on the features of special interest within the site and should identify such mitigation measures as may be required in order to avoid, minimise, or reduce any adverse significant effects.	
It is recommended that there should be a separate section of the ES to address impacts on European and Ramsar sites entitled 'Information for Habitats Regulations Assessment'. This should include but not be limited to – impact of air pollution from increased traffic on European designated sites and potential changes in ground or surface water hydrological regime.	
The ES should include an assessment of the likely impacts on the wildlife interests of the local wildlife sites. The assessment should include proposals for mitigation of any impacts.	
No additional surveys are required to add to the existing list. For each of the surveys, the ES should include clear explanations of the survey methods, results and limitations.	Peter McKeon, Senior Ecologist, Ecology Group, Environment (comment as at 16 March 2011 to the original Scoping Report).
Potential effects of the proposed development on ecological receptors and mitigation measures are satisfactory at this stage; a more detailed impact assessment is not possible until baseline surveying had been completed. The ES should demonstrate a clear commitment to implementing mitigation measures, including a description of the work to be carried out, details of methods, locations and timescales.	
Ecological enhancement measures are welcomed to be incorporated into proposed development option.	
Further consideration required of when the restoration of the stream will take place. Early consultation should take place.	Helen Tier, Planning Liaison Officer (South Downs Area), Environment Agency (comment as at 22 March 2011 to the original Scoping Report).

Key Aspects of the Project

- 15.4 As described in Chapter 4 'Description of Proposed Development', there will be a detailed focus on assessment of effects from the proposed link road across the Site and consideration of outline proposals for the rest of the Site.
- 15.5 The key aspects of the ecological assessment relate to the mitigation of the effects of the Proposed Development on the terrestrial environment. In particular this will include:
- Determining key receptors through a baseline assessment to ensure no detrimental effects on the terrestrial environment;
 - During construction, implementing specific measures to avoid or minimise harm and disturbance to breeding birds, reptiles, bats, badger and dormice that may occur in the habitats described (to be outlined in a detailed Construction Environmental Management Plan);
 - Selecting appropriate mitigation measures, in particular for dormice, reptiles and bats, to ensure that the construction and operation of the Proposed Development complies with legislation relating to protected species; and
 - Habitat creation.

Relevant Legislation, Policies and Guidelines

15.6 Appendix 15.10 in Volume 3 provides a summary of the legislative and policy framework for relevant protected species and habitats. A list of national, regional and local planning policies can be found in Chapter 3. The key legislation and policy relevant to nature conservation includes:

- Conservation of Habitats and Species Regulations, 2010 (as amended);
- Natural Environment & Rural Communities Act 2006;
- Planning Policy Statement 9: Biodiversity and Geological Conservation, 2005;
- Countryside and Rights Of Way Act, 2000;
- Hedgerow Regulations, 1997;
- Protection of Badgers Act, 1992; and
- Wildlife and Countryside Act, 1981 (as amended).

Approach to Assessment

15.7 This Ecological Impact Assessment (EclA) has been undertaken with reference to current best practice and in particular the Guidelines for Ecological Impact Assessment in the United Kingdom (Institute of Ecology and Environmental Management, June 2006), as well as the general assessment methodology outlined in Chapter 2 of this ES.

Zone of Influence or Spatial Scope

15.8 To define the total extent of the study area for ecological assessment, the proposed activities were reviewed in order to identify the spatial scale at which ecological features could be affected. The Zone of Influence is the area encompassing all predicted negative ecological effects from the proposed scheme, both those which will occur by land-take and habitat loss and those which will occur through disturbance such as noise.

15.9 The following search areas were considered appropriate for the gathering of information on during the desk study:

- 2 km for statutory and non-statutory designated sites;
- 30 km for Special Areas of Conservation (SACs) designated for bats; and
- 1 km for all other legally protected species, biodiversity action plan habitats, and locally notable/rare species, except for bats where a radius of 5 km was used.

15.10 For the field survey, the Site itself plus the immediately adjacent land was deemed an appropriate area to survey. The Site and the survey areas are marked on Figure 15.1.

15.11 The zone of influence was reviewed throughout the EclA process and was considered to be appropriate and therefore was not revised.

Temporal Scope

15.12 To define the temporal scope for ecological assessment, the proposed activities were reviewed in order to establish when impacts could occur and over what duration. Impacts have been assessed in the context of the predicted baseline conditions within the zone of influence during the lifetime of the project (i.e. the assessment takes into account how the existing conditions might change between the surveys and the start of construction and/or operation).

- 15.13 The timescale of the project is assumed to run from the intended start of construction in 2013 through the intended opening years of the scheme and beyond. It is proposed that the Proposed Development will be undertaken in several phases as outlined below:
- Construction
 - Road: 2013;
 - Phase 1: 2014-2016;
 - Phase 2: 2020-2022; and
 - Operation: 2016 is the assumed opening year for Phase 1; and 2022 is assumed to be the opening for Phase 2.
- 15.14 The assessment will cover all of the construction periods as well as the changes in operational effects. However, as the works will be spread out over a long timescale it must be recognised that there are difficulties in accurately predicting the effects of the later stages of development. For example, a species that is common and has no legal protection at this time may decline in numbers and become protected by law before construction of the later stages of development. For this reason, update surveys and Ecological Impact Assessments may be required for the reserved matters application for Phase 1 and are likely to be required for Phase 2.

Data Gathering

- 15.15 The MAGIC (Multi Agency Geographical Information for the Countryside) website (www.magic.defra.gov.uk) was used to find all statutory designated sites of importance for nature conservation and Ancient Woodlands within 2 km of the Site. It was also used to search for any statutory designated sites that are downstream of the Site. MAGIC was also used to find Special Areas of Conservation (SACs) designated specifically for bats within 30 km of the Site.
- 15.16 Ordnance Survey (OS) maps were used to identify the presence of water bodies within 500 m of the Site, in order to establish if the Site could be used as terrestrial habitat for great crested newts, a European protected species that uses terrestrial habitat up to 500 m from their breeding ponds. OS maps were also used to identify any water courses close to the Site. Aerial photos were reviewed where available on websites.
- 15.17 Information was obtained from Hampshire Biodiversity Information Centre (HBIC) on all protected species records within 1 km of the Site boundary, except for bats where a radius of 5 km was used. Information was also obtained on any Sites of Importance for Nature Conservation (SINCs), which are locally designated non-statutory sites, protected by planning policies at a local authority level, within 2 km of the site boundary. The UK and local Biodiversity Action Plans were reviewed to identify priority habitats and species that may be present within the zone of influence.

Phase 1 Walkover Survey

- 15.18 A walk-over ecological survey of the Site and its immediate surrounds (the survey area) was undertaken on 20th July 2010 and on 12th August 2010, broadly following the 'Extended Phase 1' methodology as set out in Guidelines for Baseline Ecological Assessment (Institute of Environmental Assessment 1995). The land west of Hulbert Road was surveyed on 13th September 2011, based on the latest design for the connection of the new link road to Hulbert Road. The extended Phase 1 habitat survey provides information on the habitats in the survey area and assesses the potential for protected/notable fauna to occur in or adjacent to the site. The main habitats within the Site were mapped and are shown on the Phase 1 Habitat Survey map on Figure 15.1, along with target notes describing habitat and species composition and highlighting features of ecological interest. Plant names follow New Flora of the British Isles (3rd edition, Stace, 2010). Frequent ecology site visits have been made following the initial Phase 1 survey

and during these site visits any changes of habitat, such as conversion of pasture to arable fields, have been noted and updated on the Phase 1 habitat map (see Figure 15.1).

- 15.19 The information gathered during the 2010 walkover survey and desk study data was summarised in the Feasibility Study and subsequent Scoping reports produced by Atkins in August 2010 and March 2011 respectively. The full desk study obtained from HBIC can be found in Volume 3 Appendix 15.11.

Consequent Investigations

- 15.20 Following the recommendations of the Feasibility Study and Scoping Report, specialist surveys were undertaken in respect of the presence of legally protected species within the survey area (details of species-specific methodologies and results can be found in individual appendices in Volume 3 of this ES):

- Assessment of hedgerows in relation to the ecological criteria set out in the Hedgerow Regulations 1997 (May 2011);
- Assessment of habitat potential for reptiles and amphibians, in particular great crested newts (carried out as part of the walkover survey in 2010);
- Great crested newt surveys (April and May 2011);
- Presence/absence surveys for reptiles in suitable habitat within the Site (completed in October 2010);
- Assessment of habitat suitability for bats and transect surveys to identify potential roosts and foraging/commuting areas (September 2010 and June 2011);
- Visual inspection of trees and buildings to assess their suitability for bat roosts (summer 2011);
- Assessment of suitable habitats for dormice and subsequent dormouse surveys to determine areas supporting this species (September 2010 and between April and August 2011);
- Two wintering bird surveys (winter 2010-2011) and four breeding bird surveys (between March and June 2011) in order to identify species present on site and the usage of the habitats within the Site;
- Badger survey to identify sett locations and foraging habitat in relation to the Site (May 2011);
- Search for signs of otters and water voles (spring and summer 2011); and
- Search for evidence of the presence of invasive weeds, including Japanese knotweed and giant hogweed (2010/2011).

Limitations to Survey

- 15.21 Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. The ecological survey has not therefore produced 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. Nevertheless, the results of this EclA have allowed an evaluation of ecological features within the zone of influence to be made, together with an assessment of the significance of any impacts of the Proposed Development and the likely requirements for mitigation.

Nature Conservation Evaluation

- 15.22 The determination of the significance of effects requires values to be assigned to nature conservation features. Such valuations are a function of the geographic context, existing designations, biodiversity values and potential nature conservation value. The geographic context of features is related to the following scale:

- International or European;
- UK or National;
- Regional (i.e. South East England);
- County (i.e. Hampshire);
- District/Borough (i.e. Havant Borough);
- Local, including features of value to the movement and distribution of wildlife within the context of the Scheme; and
- Negligible.

15.23 Table 15.2 below provides examples of how the valuation of nature conservation features might be applied at different geographical scales and is adapted from the IEEM guidelines (IEEM, 2006).

15.24 In the case of designated sites or features, the nature conservation value accorded to that designation has been recognised. For example sites designated as Special Area of Conservation (SAC) are recognised as being of value in an International context.

**Table 15.2 - Examples of Nature Conservation Value at different Geographical Scales
(following the classification of environmental values as stated in Chapter 2 of this report)**

Value	Examples
Very High	Internationally designated sites including Special Protection Areas (SPA), Special Areas of Conservation (SAC), Ramsar sites, Biogenetic Reserve, World Heritage Site, Biosphere Reserve or candidate or potential internationally designated sites; discrete areas which meet the published selection criteria for international designation but which are not themselves designated as such; or a viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas which are essential to maintain the viability of a larger whole. Resident or regularly occurring populations of species which may be considered at an International/European level¹, the loss of which would adversely affect the conservation status or distribution of the species at an International/European level; or where the population forms a critical part of a wider population; or the species is at a critical phase of its life cycle.
High	Nationally designated sites including Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Marine Nature Reserve; discrete areas which meet the published selection criteria for national designation (e.g. SSSI selection guidelines) but which are not themselves designated as such; or areas of a good example of a key habitat type identified in the UKBAP. Resident or regularly occurring populations of species which may be considered at the UK or National level², the loss of which would adversely affect the conservation status or distribution of the species across England or Britain; or where the population forms a critical part of a wider population; or the species is at a critical phase of its life cycle.
Medium	Viable areas of key habitat identified as being of Regional value in the Hampshire Downs Natural Area Profile; or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Designated sites at the county level include Sites of Importance for Nature Conservation (known in other counties by other names such as Local or County Wildlife Sites). Designated sites at the local level including Local Nature Reserves; or discrete areas which meet the published selection criteria for Sites of Importance for Nature Conservation but which are not themselves designated as such. Areas of habitat, or populations of species identified in the Hampshire BAP or listed within the Highways Agency BAP. Resident or regularly occurring populations of species which may be considered at an International/European level, or at the UK/National level, the loss of which would adversely affect the conservation status or distribution of the species across Hampshire or South East England; or where the population forms a critical part of

Value	Examples
	a wider population; or the species is at a critical phase of its life cycle.
Low	Features of local value include areas of habitat or populations/communities of species considered to appreciably enrich the habitat resource within the local context.
Negligible	Features such as intensively managed agricultural land, although under certain circumstances such habitats can still support species of ecological importance.

Notes:

1 - Species protected at a European level means: bird species listed within the Birds Directive or animal/plant species listed within the Habitats Directive.

2 - Species protected or which may be considered at the UK or National level means: birds, other animals and plants listed within Wildlife and Countryside Act 1981 (as amended) Schedules 1, 5 and 8 respectively; and/or listed for their principal importance for biodiversity in accordance with the Natural Environment and Rural Communities Act 2006 Section 41 [England]; species listed within the UKBAP or UK Red Data Books.

Criteria for Assessment of Significance of Effects

- 15.25 The assessment of the potential effects of the Proposed Development on ecological features has taken into account both on-site effects and those that may occur to adjacent and more distant ecological features. Effects can be beneficial (positive) or adverse (negative). Adverse effects can include:
- Direct loss of wildlife habitats;
 - Fragmentation and isolation of habitats;
 - Disturbance to species from noise, light or other visual stimuli;
 - Changes to key habitat features; and
 - Changes to the local hydrology, water quality and/or air quality.
- 15.26 Adverse and beneficial effects on ecological features have been characterised based on predicted changes as a result of the proposed activities. In order to characterise the effects on each feature, the following parameters have been taken into account:
- The size of the effect in quantitative terms, if known;
 - The spatial extent over which the effect would occur;
 - The temporal duration of the effect;
 - Whether the effect is reversible and over what timeframe; and
 - The timing and frequency of the effect.
- 15.27 With regard to the temporal duration of effects, temporary is taken to mean within the construction period to the expected Opening Year of Phase 1 (the latter currently programmed for 2016); any impacts that are likely to extend beyond the Future Assessment Year (2031) are considered to be permanent. Short-term impacts are those which are expected to last beyond the Opening Year but that would not continue beyond the Future Assessment Year.
- 15.28 Having characterised impacts, professional judgement has then been applied to assess whether their effects are 'significant' or not in line with the EIA Regulations. Significance is determined by changes in the integrity or conservation status of nature conservation features.

- 15.29 The integrity of 'defined' sites is described as follows and has been used in this assessment to determine the effects of the proposals on designated sites:

'The integrity of a site is 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' (IEEM, 2006).

- 15.30 The conservation status of habitats and species within a defined geographical area is described as follows and has been used in this assessment to determine the effects of the Scheme on non-designated habitats and species:

"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; 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" (IEEM, 2006).

- 15.31 While the EIA Regulations only require consideration of whether effects are significant or not, effects have also been assessed in a consistent manner with other topics using 'Significance of Effect' categories (in line with those set out in Chapter 2 of this ES).

- 15.32 Table 15.3 below provides typical descriptors of the significance of effect categories. This table is a copy of Table 2.6 in Chapter 2 of this ES. Effects of slight or neutral significance would not be significant in EIA terms. Very large and large effects would be significant. Moderate effects may be significant, depending on their character and, primarily, on the potential for them to contribute to wider cumulative effects.

Table 15.3 - Significance of Effect Categories

Significance	Typical Descriptors
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a serious change in a site or feature of district importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such issues may become a decision-making issue if leading to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local issues. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

- 15.33 Mitigation measures have been incorporated into the Proposed Development and these have been taken into account in the assessment of effects. Monitoring requirements have been identified where appropriate.

- 15.34 For the purpose of this assessment, mitigation refers to measures that are incorporated into the Proposed Development to avoid, reduce, repair, reinstate, restore, 'rescue' and off-set negative

impacts. In addition, opportunities to provide nature conservation enhancements have been incorporated within the Proposed Development.

- 15.35 In addition to determining the significance of an effect on any ecological features, the assessment also identifies any legal requirements such as protected species licensing.
- 15.36 Those features which are likely to be affected by impacts falling within moderate or greater significance of effect categories (the features being of district or greater value) are included in a summary table at the end of this chapter, which is adapted from the IEEM guidelines (IEEM, 2006).
- 15.37 Although international sites are currently considered in Chapter 17 in relation to Habitats Regulation Assessments, such sites will be included among the receptors in this chapter as well for consistency.

Baseline Conditions

Site Description

- 15.38 The Site is located on undeveloped land between Waterlooville and Leigh Park on the north western side of Havant Borough, as shown in Figure 1.2. The site lies immediately to the east of the A3(M) motorway Junction 3, and the A3(M) runs along the western edge of the site. The site consists mainly of arable fields with number of hedgerows, and is bordered by woodland, both deciduous and mixed semi-natural woodland, to the west, south and east. It also includes areas of semi-improved neutral grassland and mixed scrub with scattered bracken. A public access track (Park Lane) runs south-east to north-west across the site and crosses the A3 (M) via a footbridge. The Hermitage Stream also runs across the west boundary of the site from the A3 (M) and follows the edge of an area of woodland and semi-improved neutral grassland, described previously. These various habitats can be found in the Phase 1 Habitat Survey map on Figure 15.1 of this ES.

Designated Sites for Nature Conservation and BAP Habitats

- 15.39 There are no statutory designated sites within 2 km of the Site. There are however several internationally designated sites that fall within the potential zone of influence as agreed with Natural England, and these are dealt with specifically in the Habitats Regulation Assessment section (see Chapter 17).
- 15.40 There is one SAC designated for bats within 30 km of the Site, namely Singleton and Cocking Tunnels SAC which is located in West Sussex approximately 18 km to the east of the Proposed Site. It is designated for supporting significant numbers of Barbastelles *Barbastella barbastellus* and Bechstein's bats *Myotis bechsteinii*. Following consultation with Natural England, it was agreed that, due to distance and the lack of links between the Site boundary and the SAC, the project will not have any effect on the habitats on which the bats depend.
- 15.41 There are 52 Sites of Importance for Nature Conservation (SINC) within 2 km of the Proposed Development, and seven are either within or are immediately adjacent to it. Table 15.4 below provides a list of these seven SINC's along with the reasons for their designation, and their location in relation to the Proposed Development (as shown on Figure 15.1). A full list and location map of these SINC's can be found in Appendix 15.11.

**Table 15.4 - Summary of Designated Sites of Important Nature Conservation (SINC)
located either within or immediately adjacent to the Proposed Development**

Site Name	Reasons for Designation	Value	Proximity to Proposed Development
Beech Wood East SINC	Both for its ancient semi-natural woodland and for its woodland where there is a significant element of ancient semi-natural woodland surviving	Medium	Immediately adjacent to the west of the Site and the A3 (M)
Cherry Tree Row SINC	Ancient semi-natural woodland	Medium	Immediately adjacent to the south of the Site
Neville's Park Areas 2 & 3 SINC	Agriculturally unimproved grasslands	Medium	Immediately adjacent to the south-west and to the south of the Site Connected to Cherry Tree Row SINC and Neville's Park East Wood
Neville's Park East Wood SINC	Ancient semi-natural woodland	Medium	Overlaps Site. Approximately 0.2 ha would be affected directly Connected to Neville's Park Areas 2 & 3
Neville's Park West Wood SINC	Woodland where there is a significant element of ancient semi-natural woodland surviving	Medium	Immediately adjacent to the junction off Hulbert Road and link road
Dunsbury Hill Wood SINC	Semi-natural woodland comprising valley alderwood, which is an important community type of restricted distribution in the County	Medium	Immediately adjacent to the east of the Site
Meadow by Bell's Copse SINC	Designated for its agriculturally unimproved grasslands	Medium	Immediately adjacent to the north east of the Site Connected to Dunsbury Hill Wood SINC, to the north-east of the site

15.42 A number of Biodiversity Action Plan (BAP) Priority Habitats are recorded within 2 km of the Site, some of which fall within or are adjacent to it. These BAP Priority Habitats are:

- Wet woodland;
- Lowland mixed deciduous woodland; and
- Lowland meadows.

Vegetation and Flora

Grassland

15.43 A detailed vegetation survey was undertaken in May 2011 within fields in the south of the Site that will be directly affected by the construction of the link road. These fields were described as semi-improved neutral grassland in the Phase 1 Habitat Survey. The fields are pasture, grazed by horses and have abundant stands of rushes, particularly hard rush. Other frequent or locally abundant species present include creeping bent, crested dog's-tail, tormentil, daisy, lesser hawkbit, selfheal, common knapweed, bird's-foot-trefoil, creeping buttercup, common fleabane, silverweed and hairy sedge. Marsh foxtail and lesser spearwort are present in wet hollows. There are scattered young trees and shrubs of willow and birch.

15.44 The majority of the grassland is described in the National Vegetation Classification (NVC - Rodwell, 1992 (Reference 15.1) as MG10 *Holcus lanatus*-*Juncus effusus* rush pasture, albeit a rather species-rich form. Other NVC communities are present in small stands, including a species-poor MG5 *Cynosurus cristatus*-*Centaurea nigra* grassland in drier areas, and MG13 *Agrostis stolonifera*-*Alopecurus geniculatus* grass in wet hollows. Further details of the vegetation survey can be found in Appendix 15.1.

15.45 The grassland NVC communities MG10 and MG13 are typical of poorly-drained pastures and frequent in the south-eastern British lowland. The grassland community MG5 is typical of more species-rich pastures and meadows and occurs throughout the British lowlands but has become rare due to agricultural improvement (Reference 15.1). However, the extent of this community at the Site is small due to the generally damp underlying soil conditions.

Nature Conservation Evaluation – grassland

15.46 Overall, the grassland communities found in the survey area are of **low nature conservation value**.

Hedgerows

15.47 Five hedgerows that are within the Site or on the boundary were inspected in May 2011 in relation to the 'wildlife and landscape' criteria set out in Schedule 1 of the Hedgerow Regulations 1997. Further details are provided in the vegetation survey report in Appendix 15.1 (see Figure 15A.1 of this appendix for the location of the hedgerows surveyed).

15.48 There are three hedgerows at the Site or on the boundary of the Site that appear to qualify as ecologically important hedgerows under the Hedgerow Regulations (1997). One of these hedgerow traverses the Site from north to south between Beech Wood and Park Lane. This hedgerow qualifies as important due to the presence of dormice (a species listed on Schedule 5 of the Wildlife and Countryside Act 1981, as amended). Two other important hedgerows are adjacent to bridleway 120 in the north of the Site, and adjacent to Park Lane (bridleway 123) in the east of the Site. These qualify as important hedgerows due to their situation adjacent to bridleways, and the presence of other features such as banks, ditches and the number of woody species. The woody species present include pedunculate oak, hazel, ash, grey willow, hawthorn, blackthorn, dog rose and wild privet.

- 15.49 All hedgerows consisting predominantly of native woody species of tree/shrub are a Priority Habitat in the UK BAP and hedgerows are included in the list of species and habitats of principal importance for the conservation of biodiversity under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Nature Conservation Evaluation – hedgerows

- 15.50 All the hedgerows are considered to be of **low nature conservation value** given that they provide foraging opportunities for birds, dormice and bats and linkages to adjacent woodland.

Woodland

- 15.51 The Site only includes a small area of woodland at Neville's Park East SINC, although as described above in the section on Designated Sites for Nature Conservation and BAP Habitats, woodland adjoins the Site to the west, south and east boundary. These woodlands are designated as SINC's and are also either ancient woodlands or woodlands where there is a significant element of ancient semi-natural woodland surviving.

Nature Conservation Evaluation – woodland

- 15.52 These woodlands are designated at the county level as SINC's and are therefore of **medium nature conservation value**. They also provide foraging opportunities for birds, dormice and bats.

Arable

- 15.53 The arable fields mainly supported barley, wheat and oats with rough grassland field margins, and some include areas of set aside with rough grassland and common ruderal plants, such as thistles.

Nature Conservation Evaluation – arable

- 15.54 The arable fields are considered to be of **negligible nature conservation value** as they are subject to regular ploughing, sowing and harvesting; however, the field margins provide suitable habitat for species such as reptiles and invertebrates and are therefore of **low nature conservation value**.

Rare, Notable and Legally Protected Species

Amphibians

- 15.55 There are no ponds within the Site. Three ponds were identified within 500m of the Site and were subjected to a habitat suitability assessment. One pond held insufficient water to support great crested newts in 2011 and was not subject to further survey. Presence/ likely absence surveys in 2011 of the remaining two ponds did not identify any great crested newts. Populations of commoner amphibians, namely palmate newt and common frog, were found to be present during surveys. Detailed results of all the ponds surveyed can be found in Appendix 15.2.
- 15.56 No records of great crested newts were provided by the Hampshire Biodiversity Information Centre (August 2010). An amphibian survey undertaken in 2002 for a previous Environmental Statement did not record presence of great crested newts. The presence of commoner amphibians was recorded and these were common frog and palmate newt (Reference 15.2).

Nature Conservation Evaluation – amphibians

- 15.57 No great crested newts have been identified within 500 m of the Site and therefore this feature does not have a nature conservation value. Given that surveys have been carried out in 2002 and again in 2011, and most of the ponds have poor / below average habitat suitability it is unlikely that a significant population of this species would establish within 500 m prior to the start of construction.

Reptiles

- 15.58 Data obtained from the Hampshire Biodiversity Information Centre has shown that there are records of reptiles within the Site and also within 1 km of the Site. Species include adder, grass snake, slow worm and common lizard. Between September and October 2010, seven reptile surveys were carried out during suitable weather conditions, in suitable habitat within the proposed development such as hedgerows, grasslands and grassland with scrub mosaic (a map showing the location of the reptile surveys can be found in the detailed reptile survey report in Appendix 15.3). The Site supports four reptile species; adder, grass snake, slow worm and common lizard, and is therefore classified as a Key Reptile Site in accordance with the guidelines for 'Survey Assessment: Key Reptile Sites' presented in Froglife Advice Sheet 10 (Reference 15.3).
- 15.59 The presence/absence survey undertaken was not intended to determine a population estimate. Guidance available when the surveys were undertaken states that twenty survey visits are recommended to gain a relative population size and identify key areas (Reference 15.3) while only 7 survey visits were undertaken to determine presence/absence. However, new guidance from Natural England (TIN 102) advises that the population can be assessed in broad terms to give a population size class based on peak counts under good conditions. Data collected suggest that at least a small population of adder and grass snake and medium populations of slow worm and common lizard are present.
- 15.60 The hedgerows that are present across the Site provide important corridors for reptiles and link between other areas of suitable habitat across and outside the Scheme. One particular defunct hedgerow identified as the "adder hedge" on Figure 15A.1 of the hedgerow report (Appendix 15.1) had records of adders, grass snake and slow worm basking within the bramble during surveys in September and October 2010. When reptiles, particularly adders are recorded basking close to areas such as this hedgerow during autumn it is often a strong indication that the site is used as a hibernation den (Hibernaculum). Adders in particular are loyal to such sites often using them every year of their lives, which can be 20 or more years.
- 15.61 Detailed results of the reptile surveys can be found in Appendix 15.3.

Nature Conservation Evaluation – reptiles

- 15.62 The reptile population on site is of **medium nature conservation value**. This is due to the fact that four species of reptiles are present and breeding within the Site.

Bats

- 15.63 Data obtained from the Hampshire Biodiversity Information Centre has shown that there are records of bats within 5 km of the Site. Species include common pipistrelle, noctule, serotine, Bechstein's, Brandt's, whiskered, Daubenton's, natterer's and brown long-eared. The records also included pipistrelle and long-eared bat records that were not identified down to species level.
- 15.64 At least five species of bats have been recorded using the Site in 2010 and 2011, namely common and soprano pipistrelles, serotine, noctule, and a myotis species likely to be natterer's.
- 15.65 The field margins, hedgerows, woodland (particularly Cherry Tree Row and Beech Wood East SINCS), grassland and Hermitage Stream provide good habitats for bats. These habitats attract insects which are prey for bats. In addition, tree lines, woodland edges and hedgerows in particular are used as flight lines for both commuting and foraging. Areas of woodland have the potential for roosting and hibernating bats, particularly where mature trees have features, such as cracks, woodpecker holes, loose bark and dense ivy covered limbs.
- 15.66 Numerous trees across the Site have been identified as having medium to high bat roosting potential. These include veteran trees within all surrounding SINCS, mature oak trees along Park Lane and along the bridleway to the north of the site that leads into Dunsbury Hill Wood, and individual mature oak trees located within the footprint of the proposed link road.

15.67 Two important commuting routes have been identified during the transect surveys, namely the long hedgerow that crosses the site between Park Lane and the edge of Beech Wood East SINC, and along the bridleway that runs west to east from Park Lane into Dunsbury Wood SINC (immediately north of Phase 2). The locations of these commuting routes, as well as the trees with bat roosting potential and a summary of the bat activity recorded in 2010 and 2011 are illustrated in Figure 15D.3 in Appendix 15.4.

15.68 Full details of the bat surveys (including transect surveys, tree inspections and passive monitoring using anabats) can be found in Appendix 15.4.

Nature Conservation Evaluation – bats

15.69 All native bats are European Protected Species. In addition, serotine and pipistrelle bats (both common and soprano) are Hampshire BAP species. Therefore, bats and their roosting/foraging/commuting habitats are of **medium nature conservation value**.

Dormice

15.70 Although there were no historical records of dormice within 1 km of the Site, dormice were recorded across the Site throughout the survey period in September 2010 and from April to August 2011. The presence of juveniles indicates that there is a successful breeding dormouse population in the area.

15.71 Woodland within the Site, particularly Beech Wood East SINC and Cherry Tree Row SINC have high potential for foraging, nesting and hibernating dormice, with hazel and other fruiting trees/shrubs present. Many of these woodlands are linked by scrub and hedgerows which act as corridors for dormice to move across the site, as indicated by the survey results.

15.72 Full details of the dormice surveys, including the location of the dormice tubes, can be found in Appendix 15.5.

Nature Conservation Evaluation – dormice

15.73 Dormice are found in lowland England and Wales. In England, dormice occur mainly in the southern counties, where they are still widespread but patchily distributed (Reference 15.4). Common dormice have declined in both distribution and abundance in the 20th Century as a result of woodland loss and fragmentation. The National Dormouse Monitoring programme has confirmed a significant downward trend from 1993-2002, although populations in southern England appeared to be stable (Reference 15.5).

15.74 The dormouse is a local and national Biodiversity Action Plan (BAP) priority species. The Hampshire BAP states that Hampshire is a national stronghold for dormice, holding at least 10% of the national population. However, the species is categorised as declining, scarce and highly threatened within Hampshire. Dormice are therefore considered to be of **medium nature conservation value**.

Breeding Birds

15.75 A total of 39 bird species were recorded within the survey area during the 2011 breeding bird surveys. Of the species recorded, 15 species are notable for their Schedule 1 (Reference 15.6), UK Biodiversity Action Plan (BAP) (Reference 15.7) or Bird of Conservation Concern (BoCC) (Reference 15.8) status. Eleven of the notable species recorded are thought likely to breed within or near to the survey area.

15.76 An additional notable species, nightingale, was not recorded during the breeding bird surveys but was heard singing during an evening newt survey and was thought to have possibly bred at the edge of the survey area. Nightingales are an Amber List BoCC.

15.77 More detailed results of the breeding bird surveys can be found in Appendix 15.6.

Table 15.5 - Notable Bird Species Recorded during the Breeding Bird Surveys

Species	Notable Status	Breeding Status within Survey Area	Number of Confirmed Breeding Territories within Survey Area ¹
Black-headed gull	Amber List BoCC	Not thought to breed within survey area	N/A
Bullfinch	UK BAP, Amber List BoCC	Breeding	2
Common whitethroat	Amber List BoCC	Breeding	10
Dunnock	UK BAP, Amber List BoCC	Breeding	6
Green woodpecker	Amber List BoCC	Breeding within or near survey area	-
House sparrow	UK BAP, Red List BoCC	Breeding	1 territory location (probably several pairs)
Linnet	UK BAP, Red List BoCC	Probably breeds within survey area	-
Meadow pipit	Amber List BoCC	Not thought to breed (overwinter record)	N/A
Redwing	Schedule 1, Red List BoCC	Not thought to breed (overwinter record)	N/A
Skylark	UK BAP, Red List BoCC	Breeding	1
Song thrush	UK BAP, Red List BoCC	Breeding	4
Starling	UK BAP, Red List BoCC	Breeding within or near survey area	-
Stock dove	Amber List BoCC	Breeding within or near survey area	-
Swift	Amber List BoCC	Not thought to breed within survey area	N/A
Yellowhammer	UK BAP, Red List BoCC	Breeding	5

Nature Conservation Evaluation – breeding birds

- 15.78 The assemblage of species and the number of territories of notable bird species recorded within the survey area is considered to be fairly typical of the pasture and woodland habitat present within the survey area. The breeding birds present are thought to enrich the wider countryside at a local level and are therefore of **low nature conservation value**.

Wintering Birds

- 15.79 A total of 31 bird species were recorded during the wintering bird surveys. Of the species recorded, 10 are notable for their Annex 1 (Reference 15.9), Schedule 1, UK BAP or BoCC status.

¹ Territories are confirmed when breeding behaviour (such as singing, the presence of a pair of birds) is observed in one location on two or more surveys. When breeding behaviour is observed on a single occasion, this is treated as a possible breeding territory.

- 15.80 More detailed results of the wintering bird surveys can be found in Appendix 15.7.
- 15.81 The survey area supported fairly typical wintering pasture and woodland bird species. The only wetland bird species recorded during the wintering bird surveys was lapwing. Flocks of up to five lapwings were recorded flying over the site, but no lapwings were recorded using the site itself.
- 15.82 No qualifying species for the nearby Portsmouth Harbour Special Protection Area (Reference 15.10) were recorded either within or flying over the site during the wintering bird surveys.

Table 15.6 - Notable Bird Species Recorded during the Breeding Bird Surveys

Species	Notable status
Black-headed gull	Amber List BoCC
Bullfinch	UK BAP, Amber List BoCC
Dunnock	UK BAP, Amber List BoCC
Kestrel	Amber List BoCC
Lapwing (only recorded flying over the site)	Annex 1, UK BAP, Red List BoCC
Meadow pipit	Amber List BoCC
Mistle thrush	Amber List BoCC
Redwing	Schedule 1, Red List BoCC
Song thrush	UK BAP, Red List BoCC
Yellowhammer	UK BAP, Red List BoCC

Nature Conservation Evaluation – wintering birds

- 15.83 The species assemblage recorded during the wintering bird surveys is considered to be fairly typical of the pasture and woodland habitat present within the survey area, enriching the wider countryside at a local level and therefore being of **low nature conservation value**.

Badgers

- 15.84 A badger survey was carried out for a previous Environmental Statement in 2002. An active main sett was recorded in the vicinity of the Site. Based on this record a badger survey was undertaken in 2011 in order to determine the activity status of the main sett. In addition to this, badger activity was recorded across the Site whilst Atkins ecologists were undertaking other species surveys. The surveys noted all badger activity found, noting details such as setts, hairs, latrines, snuffle holes and pathways.
- 15.85 The main sett was still in use, as indicated by fresh activity (digging, snuffle holes, pathways and latrines) in 2011. No additional setts were recorded during the surveys. This main sett is within a woodland outside of the Site, approximately 40 m from where works will be undertaken. Fresh footprints were recorded in grassland near the Hermitage Stream, and badger dung was found on field margins across the site. Snuffle holes and pathways were also recorded within Beech Wood East Site of Importance for Nature Conservation (SINC).
- 15.86 No records of badgers were provided by the Hampshire Biodiversity Information Centre (August 2010).
- 15.87 Full details of the badger surveys can be found in Appendix 15.8. To protect badgers this appendix is a confidential report that would only be made available to those with a genuine need to review the report.

Nature Conservation Evaluation – badgers

- 15.88 The Protection of Badgers Act (1992) was introduced to protect badgers and their setts mainly from badger digging and badger baiting. Since they have been afforded legal protection, badger numbers have increased in recent years. The species is widespread throughout the UK and Hampshire and has **negligible nature conservation value**. However, the effects on badgers need to be considered owing to their legally protected status.

Water Voles

- 15.89 No evidence of water voles was found during the 2011 survey of the Hermitage Stream and an assessment of the stream concluded that it was of low suitability for water voles. Further details of this survey are provided in Appendix 15.9.
- 15.90 A water vole survey was undertaken in 2002 for a previous Environmental Statement and no evidence of water voles were recorded and the Hermitage Stream was assessed to be of low suitability for water voles (Reference 15.11).
- 15.91 No records of water voles were provided by the Hampshire Biodiversity Information Centre (August 2010).

Nature Conservation Evaluation – water voles

- 15.92 No water voles have been identified within the Hermitage Stream and therefore this feature does not have a nature conservation value. Given that surveys have been carried out in 2002 and again in 2011, and the Hermitage Stream has low suitability and therefore it is unlikely that an important population of this species would establish in the Hermitage Stream prior to the start of construction.

Otters

- 15.93 No evidence of otters was found in Hermitage Stream and an assessment of the stream concluded that it was of low suitability for otters. Further details of this survey are provided in Appendix 15.9.
- 15.94 No records of otters were provided by the Hampshire Biodiversity Information Centre (August 2010).

Nature Conservation Evaluation – otters

- 15.95 No otters have been identified within the Hermitage Stream and therefore this feature does not have a nature conservation value. Given that surveys have been carried out in 2011, and the Hermitage Stream has low suitability it is unlikely that an important population of this species would establish in the Hermitage Stream prior to the start of construction.

Deer

- 15.96 The legal protection relating to deer deals with cruelty and also the methods and seasons during which the four main species can be killed. Deer attempting to cross roads can be a significant road safety issue. It was therefore considered important to determine if deer were present in the vicinity of the site and proposed new roads and to get an indication of the species present and their population density.
- 15.97 Roe deer have been regularly seen on site during the various ecological surveys undertaken, and were mainly resting/foraging within the arable fields.

Nature Conservation Evaluation

- 15.98 Deer are considered in this assessment as deer crossing roads can result in road traffic accidents and hence there are road safety and animal welfare issues that need to be considered. Deer populations are considered to be of **negligible nature conservation value**.

Other species (rabbits and foxes)

- 15.99 Sightings of the animals themselves and both dung and food remains at woodland edges and field margins. Rabbit droppings and burrows have been found along some of the field margins/hedgerows to the north of the Site but no visual sightings have been recorded.

Nature Conservation Evaluation

- 15.100 Rabbit and fox populations are considered to be of **negligible nature conservation value**.

Invasive Plant Species

- 15.101 Indian balsam (also known as Himalayan balsam) was recorded on Site for the first time in August 2011 during the last dormouse survey (it was not present on site in 2010). This invasive species was found in small patches either side of the naturalised section of the Hermitage Stream within the wooded area; it is presumed that it originates from upstream somewhere in Waterlooville. This species is an invasive species subject to strict controls on its introduction into the wild under the Wildlife and Countryside Act 1981 (as amended). Access to this area has been restricted.

Summary

- 15.102 A summary table of nature conservation evaluations of features present on or adjacent to the Site is provided in Table 15.7 below.

Table 15.7 - Summary of Nature Conservation Evaluations

Feature	Nature Conservation Evaluation
SINCS/Woodland	Medium
Grassland/Field Margins	Low
Hedgerows	Low
Arable	Negligible
Amphibians	n/a – no great crested newts present
Reptiles	Medium
Bats	Medium
Dormice	Medium
Breeding birds	Low
Wintering birds	Low
Badgers	Negligible
Water voles	n/a – not identified as present
Otters	n/a – not identified as present
Deer	Negligible
Rabbits/Foxes	Negligible

Mitigation

- 15.103 This section describes measures that will be undertaken to avoid or reduce potential adverse ecological impacts that could arise from the Proposed Development. The approach has three strands:
- Avoidance of adverse impacts (spatial and temporal) through the design of the Proposed Development and sensitive programming of works;
 - Reduction of impacts through mitigation, lessening the scale of an impact; and

- Mitigation through habitat creation and enhancement.

- 15.104 Mitigation of potential adverse effects on designated sites and habitats during construction and operation of Proposed Development is described below, and has been summarised, along with mitigation relating to protected species, in a suggested Mitigation Strategy. Specific measures required to mitigate adverse impacts on legally protected species are presented below. This section also identifies ways in which the existing conditions can be improved for some species as part of the Proposed Development.
- 15.105 As a precaution, the habitat suitability for all species recorded on Site will need to be re-assessed prior to construction to determine if such suitability has changed since the production of this ES, and if necessary, update surveys will be undertaken prior to construction.
- 15.106 During construction of the Proposed Development, measures will be implemented to avoid disturbance to breeding birds, reptiles, bats, badger and dormice that may occur in the habitats described. This includes the use of temporary fencing to limit access and thus disturbance to sensitive areas during construction. Such areas will be identified and delineated in advance of on-site works by a suitably qualified ecologist. Specific measures should be outlined in detailed Construction Environmental Management Plans (CEMPs), although an outline of mitigation measures that will be implemented is provided below.
- 15.107 Mitigation measures outlined in this section will be implemented in order to ensure that the construction and operation of the Proposed Development complies with legislation relating to protected species. Confidence in the assessment of significance will depend on the success of mitigation, and measures should be employed to monitor mitigation success and provide corrective measures. A five-year post-construction monitoring plan will therefore be drawn up by a suitably qualified ecologist and incorporated into the CEMPs.

Designated sites and BAP Habitats

- 15.108 The southern part of the proposed link road will result in the direct loss of approximately 0.2 ha of Neville's Park East Wood SINC, which consists of wood pasture with approximately 14 mature oak trees (this will depend on the precise extent of the earth works required to build the road) and a small area of willow scrub. The pasture is species-poor and the ecological interest of this area is limited to the trees. In addition, the Proposed Development is immediately adjacent to several SINC's (see Table 15.3 in previous section above for more details). Mitigation measures should therefore include:
- Additional buffer planting along all SINC boundaries to reinforce and protect their edges;
 - Protection of all SINC's edges during construction;
 - Construction and operational lighting to be strictly controlled to minimise light-spill into all SINC's; and
 - Construction noise reaching all SINC's to be minimised;
- 15.109 The Proposed Development has been designed to minimise loss of ancient woodland and loss of SINC habitats, but given the topographical and line sight constraints in relation to the construction of the link road, the loss of a small number of mature oak trees that form part of Neville's Park East Wood ancient woodland SINC is unavoidable. It is not possible to provide direct compensation for the loss of ancient woodland given its history and complexities, and ancient woodlands' nature conservation value cannot be recreated in anything less than hundreds of years. However, the following measures could provide mitigation and compensation for the loss of an area of SINC and enhancement of the local area:
- Refining detailed design to ensure that the number of oak trees to be felled is the minimum necessary;

- Re-planting of native oak trees in the vicinity of these existing trees, on the edge of Neville's Park East Wood / Neville's Park Areas 2&3;
- Localised felling of self-set aspens which have limited arboricultural and landscape significance, and also are not in keeping with the ancient woodland species to the south.
- Habitat creation area to the north of the Site (approximately 3ha), to be a mosaic of woodland edge, species-rich grasslands and scrub (composition to be finalised at detailed design), with scrapes to create temporary holdings of water. This will also aid in meeting the Core Strategy requirement for the proposed development to meet a BREEAM "excellent" standard;
- Extension of Beech Wood East SINC boundary to include the new habitat creation area; and
- Management plan for Beech Wood East SINC (to include the new habitat creation area) to improve biodiversity.

Vegetation & Flora

Grassland

- 15.110 Mitigation will be provided for the loss of semi-improved neutral grassland due to the construction of the site access link road. Where stands of grassland can be retained, they will be incorporated into the landscaping design. New grassland will be created within a habitat creation area that will include native grassland species characteristic of the local area and soil conditions to the north of the Proposed Development.
- 15.111 The turf from the existing species-rich grassland within the footprint of the proposed hotel could be used to contribute to the habitat creation area.

Hedgerows

- 15.112 The layout of the link road and access routes through the various plots at the Site will be designed to minimise the loss of ecologically important hedgerows (under the Hedgerow Regulations, 1997), and the other hedgerows at the Site. The link road and access routes should cross the hedgerows at a perpendicular angle to minimise loss of hedgerow.
- 15.113 There are two hedgerows, both categorised as 'important' hedgerows under the Regulations 1997, which will be severed as a result of the link road and could be affected by secondary access routes through plots. Hedgerows are a Priority Habitat in the UK BAP and a habitat of principal importance for the conservation of biodiversity under Section 41 of the NERC Act 2006. The NERC Act requires public authorities to have regard to the purpose of conserving biodiversity in relation to these species and habitats. Mitigation measures would therefore be implemented. The sections of these 'important' hedgerows (i.e. Long Hedge (H3) and Park Lane Long Hedge (H1) (as shown in Figure 15A.1 in the vegetation survey report in Appendix 15.1) could be translocated to a nearby field boundary.
- 15.114 Retained sections of hedgerow will be protected by a buffer equivalent to the Root Protection Zone defined by the British Standard Trees in Relation to Construction (BS BS5837:2005). All works and vehicle movements within the Root Protection Zone will be minimised, and strictly controlled according to the standards. Sensitive areas would be identified and delineated in advance of on-site works and the movement of machinery restricted in these area in order to prevent root compaction and accidental damage to trees and hedges.
- 15.115 New hedgerows should be designed to provide additional habitat linkages to existing hedgerows or areas of broadleaved woodland, and comprise native species that are characteristic of the Site and the local area. For instance, new hedgerows could be planted either side of the new bridge that will support the new link road over the Hermitage Stream in order to maintain habitat connectivity between Cherry Tree Row SINC and Beech Wood East SINC, which would otherwise be lost to the new link road. In addition, existing hedgerows should be improved with

supplementary planting of native species characteristic to the area to fill gaps and link isolated section.

- 15.116 A monitoring programme would be set up to ensure that there is sufficient survival of individual plants so that the planted hedgerows remain intact along their length. It would also be necessary to monitor the diversity of the new hedgerows to ensure that the species diversity is at least equal to that of the hedgerows they have replaced. Corrective measures would also be proposed should gaps appear in the hedgerows or woody species are lost from them.

Woodland

- 15.117 The only loss of woodland habitat to the scheme includes the loss of 0.2 ha at Neville's Park East Wood SINC. Since the Site is surrounded by ancient woodland to the west, south and east, which is a BAP habitat, woodland mitigation is dealt with in the above section on Designated Sites and BAP Habitats.

Rare, Notable and Legally Protected Species

Amphibians

- 15.118 No great crested newts have been found to be present during surveys in 2011 or in previous surveys in 2002. Only palmate newts and common frogs have been identified in the surveyed ponds. No ponds will be affected by the Proposed Development as the three ponds surveyed are outside the Site boundary.
- 15.119 Sustainable drainage system ponds (SUDS) which will be created for the Proposed Development will benefit amphibians through natural aquatic planting. In addition, it is proposed that shallow "scrapes" that will naturally hold water seasonally, will be created in a new habitat creation area in the field to the north-west of Park Lane, along with a mosaic of grassland and scrub, woodland edge and hedgerow planting to enhance the existing habitat for amphibians.
- 15.120 Pond A which is to the north of the Site was dry at the time of surveys and overgrown with willow and cherry laurel. Although compensation for amphibians is not required, enhancement measures for amphibians and reptiles are recommended, and it is therefore proposed to enhance Pond A by restoration through removal of dense scrub, re-profiling the pond with an excavator and allowing the pond to regenerate naturally.
- 15.121 The hedgerow running alongside the existing bridleway between Park Lane and the woodland in which Ponds B and C are located (Dunsbury Hill Wood / Bells Copse), should be protected and enhanced with additional hedgerow planting, whilst the woodland itself should be protected by buffering with landscape planting using native species of local provenance. This planting will extend around the margins of the current field designated for Phase 2 Development Plots B1 / B2 as shown in the Parameter Plan 2. The landscape planting will protect and buffer the existing Park Lane hedgerow / drainage ditch and Dunsbury Hill grassland. Log piles created using trees felled during construction will be placed under these hedgerows in order to provide shelter for amphibians, invertebrates and other wildlife.

Reptiles

- 15.122 Four species of reptiles (adder, grass snake, slow worm and common lizard) were found to be present during surveys in 2011 and also in previous surveys in 2002. Only habitat that was deemed suitable for reptiles was surveyed, such as hedgerows, grasslands and grassland with scrub mosaic. The arable plots themselves were not surveyed as they were disturbed through ploughing and therefore offered little potential for reptiles.
- 15.123 Mitigation measures are required to ensure that reptiles are not adversely affected. This consists primarily of avoiding sensitive areas and phasing of the construction works. Additional habitat creation, enhancement and management would also be undertaken to benefit reptile populations in the future. A suitably qualified ecologist must be present during any vegetation clearance works

to undertake pre-clearance checks and ensure that no reptiles or other protected species are present.

- 15.124 As many of the hedgerows as possible will be retained within the Proposed Development and will be suitably protected during construction works. In addition to this, planting of suitable native species of local provenance should be used to buffer these hedgerows, in particular the defunct hedgerow noted for its high potential as a reptile hibernation site. The planting at the eastern end of this hedgerow will link in with the woodland edge of Cherry Tree Row SINC, and provide a linking corridor for reptiles and other wildlife to other areas of suitable habitat. The gap required to allow vehicular access to the development plots immediately south of this hedgerow should be located at the western end of this hedgerow in order to avoid the potential reptile hibernation site.
- 15.125 The long hedgerow that crosses the Proposed Development from south to north between Beech Wood and Park Lane will be severed by both the proposed link road and could be affected by a secondary access route. Low numbers of slow worm and a single adder have been recorded as present at the base of this hedgerow. Due to the fact that the hedgerow will be severed and in order to avoid killing or harming reptiles, animals would be relocated outside the footprint of the Proposed Development. The reptiles will be translocated to an area adjoining the A3(M) verge to the north-west of the Site boundary which has been proposed as a new habitat creation and enhancement area. This will be done using reptile fencing and a high density of artificial refugia.
- 15.126 Other areas with reptile potential, such as along the route of the proposed link road, will be made unsuitable for reptiles using habitat manipulation. Strimming at different levels will encourage reptiles to move into areas of suitable habitat outside the working areas in order to protect the reptiles from harm during construction works. A suitably qualified ecologist must be present during any vegetation clearance works to undertake pre-clearance checks and ensure that no reptiles or other protected species are present. If reptiles are found then they will be carefully moved by the ecologist to suitable habitat outside the works. Agreement would be reached with the landowner to ensure the management of the receptor sites remains suitable for reptiles during the construction phase.
- 15.127 The hedgerows to the south and east of the proposed habitat creation and enhancement area should be buffered with additional hedgerow planting of suitable native plants of local provenance. Additional woodland planting will add a buffer zone to Beech Wood East Site of Importance for Nature Conservation (SINC) bordering the west of this area. The rest of this area should contain a mosaic of grassland and scrub, using scrub planting such as hawthorn, blackthorn, bramble and spindle. Two ponds should be created within this grassland and scrub mosaic, which will benefit reptiles, particularly grass snakes which feed on amphibians that will be attracted to the ponds.
- 15.128 Within this habitat creation / enhancement area two artificial hibernation sites (hibernacula) could be created for reptiles using felled timber, brash, tree roots and suitable inert hardcore / rubble from other areas of the Site. Turves can be taken from the species-rich grassland to the south-west of the Site (at the location of the footprint of the proposed hotel), and placed on top of these hibernacula and also within other areas of this Site. These hibernacula can also benefit amphibians. These hibernacula must be in place before the reptile translocation takes place.
- 15.129 Log / brash piles and decaying tree stumps with roots can also be used within the habitat creation /enhancement site as areas for reptiles to bask and shelter, and in the case of the decaying tree stumps can be used as potential egg-laying sites for grass snakes. These features and the hibernacula should be placed in south-facing areas that are not at risk of flooding.
- 15.130 In addition to this, a combination of grassland and scrub using plants of local provenance should be planted to buffer Phase 2 Development Plots B1 / B2 to the east of Park Lane from Dunsbury Hill Grassland SINC. Slow worms and common lizards were recorded in this grassland during the surveys of 2011, and the aim of this buffer planting is to create habitat with basking and sheltering opportunities for reptiles.

- 15.131 The restoration of the Hermitage Stream with native marginal planting, and the creation of several SUDS with native aquatic and marginal planting will benefit grass snakes which can use the re-aligned Hermitage Stream as a habitat corridor to other areas of suitable habitat; and will bask and feed around the margins of the SUDS.

Bats

- 15.132 The Proposed Development has the potential to have adverse effects upon foraging/ commuting bats and would result in the loss of bat roosting opportunities. The design of the Proposed Development has aimed to avoid such effects as far as possible. Owing to their legal status a Natural England development licence would be required to destroy or damage any bat roost. If works would affect a roost, a licence would be obtained before work on the roost began. The licence applications would provide full details of the works proposed (including programme), replacement roost creation, and the working methods to ensure avoidance of harm to bats, and any additional survey and monitoring work that would be undertaken as part of each licence. The approach that would be taken to mitigation is described in more detail below. These measures are designed to ensure that the Proposed Development would not compromise the Conservation Status of bats in this part of their natural range and include:

- Measures to minimise risks to individual bats during tree felling and subsequent construction;
- Measures to protect retained woodland from accidental incursion during site works;
- Enhancement of field margins, woodland edges and hedgerows;
- Habitat creation (including erection of bat boxes within woodland SINC's);
- Restriction of new lighting; and
- Measures to encourage bats to use new features to cross the link road.

- 15.133 Areas of woodland habitat that will not be affected by the works will be protected by high visibility fencing to minimise risks of accidental incursion.

Trees with Potential for Roosting Bats

- 15.134 Although no roosts have been confirmed on Site to date, several trees with medium to high roosting potential may be lost as a result of the Proposed Development. Therefore there is a risk that roosting bats would be present at the time of felling. A Natural England licence would be required if bat roosts are confirmed in any trees to be felled. Measures to minimise the risk of harm to bats when felling trees with potential to support bats will include:

- Undertaking a climbing inspection and/or undertaking dusk and dawn surveys at trees with high roosting potential during the active period for bats (May to September inclusive) prior to felling;
- Avoidance of deliberate killing, injury or disturbance to bats through appropriately timing the felling and/or pruning of trees when bats are least vulnerable to harm (i.e. when not hibernating in winter or in maternity roosts in summer). Between March-April and October would be the best times for tree works in relation to bats, October being the preferred period as it also avoids the risk of damage of occupied birds' nests.
- Dawn re-entry surveys will be carried out for the trees with high bat roosting potential to check no bats have returned to roost on the morning they are due to be felled, followed by 'soft felling' under ecologist supervision, whereby the trees are cut down in sections, which are lowered gently to the ground and left in situ overnight for any bats present to escape.
- Alternative roosting habitat will be provided. A number and variety of bat boxes will be erected in nearby trees to compensate for the loss of roosting opportunities (on a ratio of at least two bat boxes erected per tree with roosting opportunities removed, to be suitable for bat species of various sizes, from pipistrelle bats to noctules) prior to these trees being felled. If any roosts are confirmed as present in trees to be lost, if possible, 'roost sections' of wood

from the known roost trees could be cut out and affixed to other nearby trees that would be retained. Mitigation for the loss of a known roost would need to be undertaken under a Natural England licence.

- Maintenance and monitoring of the bat boxes and any other replacement roost habitat will be undertaken annually, including checks for evidence of use by bats and cleaning, repairing and replacement as required within the five year post-construction management and monitoring period. The checks will involve looking inside each of the bat boxes and would therefore need to be carried out by a licensed bat worker owing to the risk of causing disturbance to bats. The results of the monitoring will be collated and sent to Natural England and the Hampshire Bat Group.

Bat Commuting and Foraging Habitat

- 15.135 To date, several areas of important bat commuting/foraging habitat have been identified within the footprint of the proposed development. These areas are illustrated in Figure 15D.3 in Appendix 15.4.
- 15.136 There are currently no existing barriers to foraging and dispersal routes for bats within the Site. The field and woodland margins provide good foraging habitats whilst the hedgerows and woodland edges provide good commuting routes. The proposed link road would reduce the linkage between woodlands on either side of the road, and is especially likely to reduce connectivity between Cherry Tree Row SINC and the long hedgerow that crosses the Site to the west of Park Lane. Bat “hop overs” in the form of tall semi-mature trees should therefore be planted close to the road and some of the access routes, on either side, in order to help bats cross this new barrier to commuting.
- 15.137 Construction close to the edges of woodland and either side of the long hedgerow that crosses the Site would reduce the amount of feeding habitat in the short term, until replacement habitat has established. However, new planting in the form of buffer zones and hedgerow strengthening, as well as habitat creation, will provide compensation.
- 15.138 There will be an increase in lighting across the Site, mainly from the new junction to Hulbert Road, the roundabout leading to the hotel, and from the business park. In addition, 24 hour security lighting would be required at compound sites during the construction phase as well as during the operation of the site. Lighting is known to have adverse impacts on some bat species. Adverse impacts caused by light pollution will be minimised by restricting new lighting to major junctions. Impacts would be further reduced by the use of full cut-off luminaires which emit no light above the horizontal. Temporary lighting design will minimise light spill in areas that could be used by bats during construction.
- 15.139 Directional lighting will be used in particular to avoid light spill onto commuting routes and woodland edges. This is particularly important (but not limited to) around the edges of Cherry Tree Row SINC, either side of the long hedgerow that crosses the Site between Beech Wood East SINC and Park Lane, and along the bridleway that connects Park Lane to Dunsbury Hill Wood SINC. Lighting for the proposed hotel roundabout should be designed in such a way that there would be no light spill at the new bridge location (to the south of the roundabout), as the bridge could be used by bats as a commuting route under the link road.

Dormice

- 15.140 Dormice have been found to be present in hedgerows and woodland edges across the Site. The design of the Proposed Development has aimed to reduce loss of dormouse habitat wherever possible. As dormice are a European Protected Species, a Natural England licence would be required prior to the start of construction. The mitigation scheme is explained below.

- 15.141 Areas of dormouse habitat that will not be affected by the works will be protected by high visibility fencing to minimise risks of accidental incursion. The timing of works would need to be carefully planned to minimise risks of harm to individual dormice. This would include:
- Coppicing trees, shrubs and scrub with hand tools during the winter months, when dormice would be hibernating at / below ground level and, where practical, removing all material by hand to avoid impacts on dormice; and
 - Undertaking ground disturbance, such as grubbing out tree roots and soil stripping after dormice have emerged from hibernation.
- 15.142 The additional buffer planting mentioned under the woodland mitigation section, and the hedgerow strengthening mentioned under the hedgerow mitigation section will improve dormice habitat by including species that dormice rely on for feeding, nesting and hibernating, such as hazel, bramble, honeysuckle, blackthorn and elder.
- 15.143 Dormouse boxes will be erected within woodland SINC's to provide additional nesting sites;
- 15.144 A dormouse crossing point constructed from meshing with planted climbers / ivy will be installed under the new link road bridge over the Hermitage Stream to reinstate the linkage between Beech Wood East SINC and Neville's Park East Wood SINC that will be lost to the new link road. New hedgerows should be planted either side of the bridge in order to maintain habitat connectivity.
- 15.145 A temporary dormouse bridge should be erected along the Long Hedgerow (H3) if it is to be severed as a result of a new secondary access route between plots. This hedgerow is currently used by dormice and provides a link between the woodland habitat to the south and those to the north east. The bridge will maintain a route for dormice. The temporary bridge will be composed of a wire mesh tube attached to either side of the hedgerow. Since semi-mature trees will be planted either side of this gap to act as bat "hop-overs" (see previous section on bat mitigation), the tube could be attached to these. Such tubes have been shown to be used by captive dormice (PTES, Winter 2009). Once planting has established to provide natural linkage across the new gap, then the dormouse bridge can be removed.
- 15.146 The severed section of this hedgerow (H3) can be translocated to its northern end so that it closes the small gap that currently exists between H3 and Park Lane Short Hedge (H2) which runs perpendicular to H3.

Birds (breeding and wintering)

- 15.147 Damaging or destroying the occupied nest of any wild bird (whilst being built or in use) is an offence under the Wildlife and Countryside Act 1981. Therefore any vegetation clearance in which birds are nesting, should be undertaken outside the breeding season. The breeding seasons for different birds vary, depending on the species, location and on weather conditions. The core breeding season for most birds can be taken to run from the beginning of March to the end of August, but breeding often occurs in February or September for some species. Work outside this period runs less risk of destroying active nests although care is needed at all times to avoid committing an offence since birds have been recorded nesting in every month of the year.
- 15.148 If vegetation clearance or the demolition of buildings or structures outside the breeding season is not possible, further surveys for breeding birds should be carried out prior to any works being undertaken. A minimum of a survey 24 hours prior to commencement of works would be required in order to minimise opportunities for nest building between the survey and the start of works. Any nest in use or being built during this survey may need to be left undamaged for the entire nesting period and alternative approaches to the works proposed.
- 15.149 Grassland habitat and some hedges will be lost as a result of the Proposed Development. Compensation should include the planting of woodland to extend Beech Wood eastwards into the Site. This will also include habitat creation within a field immediately to the north of the Site to provide a habitat mosaic of woodland edge, scrub and grassland with ponds. In addition the Site

will retain existing important trees, particularly protected trees, and hedgerows, within the Proposed Development.

- 15.150 The creation of these habitat areas will ensure that suitable nesting and foraging habitat is available for the woodland and scrub bird species recorded using the Site both during the breeding and wintering seasons.

Badgers

- 15.151 Standard measures such as covering open trenches at night and fencing woodland edges to avoid accidental incursion into the woodland where the sett is located will be required throughout the construction period. An update survey will be undertaken prior to the start of site clearance to check whether any new setts have been dug in locations where a licence could be required. Additional planting of native tree and shrub species of local provenance will be planted to provide a buffer zone to Beech Wood East and Cherry Tree Row SINC. In addition to this, hedgerows to the south and east of the proposed habitat creation area (which is adjoining the A3(M) verge to the north-west of the Site) will be buffered with additional hedgerow planting of suitable native plants of local provenance to provide foraging opportunities for badgers. The rest of this area will contain a mosaic of grassland and scrub, using scrub planting such as hawthorn, blackthorn, bramble and spindle.
- 15.152 The additional buffer planting and habitat creation / enhancement area will benefit the badgers by providing foraging opportunities and also protect the existing main sett from disturbance.

Water voles

- 15.153 At the time of writing this report no mitigation is needed for this species.
- 15.154 Re-alignment of the Hermitage Stream to create a more natural route will enhance the stream ecology and habitat and could provide potential opportunities for water voles to become established through natural colonisation.

Otters

- 15.155 At the time of writing this report no mitigation is needed for this species.
- 15.156 Re-alignment and restoration of the channelized part of the Hermitage Stream to create a more natural route will enhance the stream ecology and habitat and could provide potential opportunities for otters to become established through natural colonisation.

Deer

- 15.157 Roe deer has been recorded within the Site. The new link road will potentially act as a barrier to deer movement and reduce their foraging habitat, the speed limit of the link road will be 30 miles per hour. Should a deer try to cross the road when a vehicle drives along it, the risk of collisions will be reduced by this low road speed. In addition, suitable foraging habitats are already available around the Proposed Development, and the new buffer planting will also provide refuge. No mitigation for deer is considered necessary.

Foxes and Rabbits

- 15.158 If holes / burrows for other species (e.g. fox or rabbit) are discovered, care will be taken to avoid inhumane killing. Under the Wild Mammals (Protection) Act (1996) it is an offence to intentionally inflict unnecessary suffering to any wild mammal.

Invasive Plant Species

- 15.159 The Proposed Development would affect areas where the non-native invasive species Indian balsam (also known as Himalayan balsam) is present, in particular with regards to the restoration of the Hermitage Stream and the construction of the bridge that will carry the new link road over the stream. This species is invasive and is subject to strict controls on its introduction into the wild under the Wildlife and Countryside Act 1981 (as amended), and will be dealt with according to the

Environment Agency guidelines available on the website www.natregs.gov.uk. Control measures will also be outlined in the Construction Environmental Management Plan for the Site.

Identification and Assessment of Likely Significant Effects

- 15.160 The first part of this section describes the construction impacts that would result from the construction period itself, whether short term, long term or permanent. This is followed by a description of longer term impacts that would occur as a result of the Site's operation after construction.

Construction Effects of the Scheme

Designated sites and Woodland

- 15.161 Parts of the construction site, especially to the south west and south of the Site, would lie immediately adjacent to several Sites of Importance for Nature Conservation (locally designated sites). There would be short term adverse impacts associated with construction noise and lighting and the risk of aquatic and dust pollution, but there would be pollution prevention measures to minimise these. These short-term impacts would not affect the integrity of the designated sites. Temporary fencing would be used to avoid accidental incursion. There would be a loss of approximately 0.2 ha of habitat, resulting in the loss of approximately 14 mature oak trees. Compensatory tree planting will be provided along with additional habitat creation and buffer planting. A management plan will be produced for the habitat creation area. Therefore, these impacts are assessed as **neutral and not significant**.

Grassland

- 15.162 Construction of the link road would result in the loss of approximately 0.5 ha of species-poor semi-natural neutral grassland of local value. The construction of the hotel would result in the loss of approximately 1 ha of more species-rich grassland. However, replacement species-rich native grassland habitat will be created as compensation for the loss, as a mosaic with scrub. At least a third of the turf from the species-rich area will be translocated into the habitat creation area at the north of the Site. This new habitat is expected to establish within 2-3 years therefore the short term impacts of the site access link road on the vegetation and flora will be **neutral and not significant**.

Hedgerows

- 15.163 The construction of the link road and access routes would result in the severance of two ecologically 'important' hedgerows (Long Hedge (H3) and Park Lane Long Hedge (H1)). There would also be an adverse effect on species that may use the hedgerows for commuting, particularly dormouse and bats, from fragmentation of the two hedgerows.
- 15.164 As mitigation for the direct loss and fragmentation of hedgerow habitat, replacement and supplementary hedgerow planting will be provided. Mitigation should include the translocation of the sections of hedgerows severed and the protection of retained hedgerows from damage during the construction period. This will result in a greater length of hedgerow overall and improved connectivity through the linking of isolated sections. The provision of replacement and supplementary hedgerow planting will mitigate the long-term impacts of the loss of hedgerow. Overall, the impact on hedgerows would be **neutral and not significant**.

Amphibians

- 15.165 Given that great crested newts are not currently present within 500 m of the Site there would be no impact on this species. Habitat creation would include ponds to benefit common amphibians. This habitat creation would result in a **permanent beneficial impact of neutral significance**.

Reptiles

- 15.166 A number of areas of reptile habitat, including woodland, scrub, rough grassland and sections of hedgerow would be lost to the Proposed Development. Risks of killing or injuring reptiles during site clearance would be minimised through the standard mitigation measures described above. New habitats would be created as part of the habitat creation / enhancement proposals to provide suitable habitat for reptiles. These would be subject to a long term management plan and would result in an increase in the Site's potential to support reptiles. It is therefore considered that effects on reptiles would be **permanent beneficial of slight significance**.

Bats

- 15.167 A number of mature trees with potential to support bat roosts would be lost to the Proposed Development. This would be compensated for by the provision of bat boxes, combined with planting new woodland. Further detailed surveys of potential roosts, carried out prior to construction, would provide information regarding the number of boxes to be *used* and their ideal situation. Strict measures would be followed to minimise any risk of killing or injury of individual bats during felling operations.
- 15.168 There would be a loss of foraging habitat as a result of the Proposed Development. This would be compensated in the form of buffer zones created around the edges of woodlands, and the strengthening of linear corridors such as hedgerows, providing compensation for the areas of foraging habitat to be lost. During the construction phase itself, lighting would be required in some working areas. These would be designed to minimise light pollution. There will be a temporary loss of suitable foraging habitats within the Site as a result of the removal of habitat and also regular disturbance from construction activities deterring bats from foraging in the area. This short-term effect of the construction activities is considered to be of **temporary adverse of slight significance**.

Dormice

- 15.169 Dormouse habitat would be removed in some places. The long term effects are discussed below. During the construction phase itself, mitigation measures would minimise risks of killing or injuring individual dormice during habitat clearance. The enhancement of existing habitat would provide immediate habitat improvements, helping maintain the local dormouse population while the newly planted areas become established. There would be an overall increase in woodland habitat through the proposed buffer planting, hedgerow strengthening, habitat creation, and enhancements of connectivity across the Site through a dormouse "underbridge". Therefore, taking these measures into account, the effects would be **neutral and not significant**.

Breeding Birds

- 15.170 As a result of the Proposed Development, some habitat currently used by breeding birds will be lost. The mitigation proposals will increase the area of woodland within the survey area, retain the majority of the present hedgerows and create a new habitat mosaic of scrub, grass and woodland edge within a field immediately to the north of the Site. During the construction process, any vegetation clearance will be timed to occur outside the breeding season or carried under the careful monitoring of a suitably experienced ecologist to ensure that no bird nests are disturbed. Vegetation clearance will therefore not result in loss of occupied birds nests. There will however be a temporary loss of suitable nesting sites within the survey area as a result of the removal of habitat and also regular disturbance from construction activities deterring birds from nesting in the area.
- 15.171 In the longer term this proposed habitat creation may actually enhance the survey area for some of the breeding bird species recorded during the breeding bird surveys. For example, the increase in woodland and scrub areas may be of benefit to notable breeding species, such as bullfinch, common whitethroat, dunnock, nightingale and song thrush. However, the loss of large areas of

grassland within the survey area will have an adverse impact on some notable breeding species, such as skylark and yellowhammer.

- 15.172 The bird species breeding within the survey area are considered to be of low (local) ecological value. Overall, some of the breeding bird species recorded within the survey will benefit and some will be adversely affected. The long-term effects of the Proposed Development on breeding birds are considered to be **neutral and not significant**.

Wintering Birds

- 15.173 As a result of the Proposed Development, some habitat currently used by wintering birds will be lost. The mitigation proposals will increase the area of woodland within the survey area, retain the majority of the present hedgerows and create a new habitat mosaic of scrub, grass and woodland edge within a field immediately to the north of the Site.
- 15.174 During the construction process there will be regular disturbance, for example from the use of machinery and vehicles. There will also be a loss of foraging habitat as a result of vegetation clearance. These construction processes will have a temporary adverse impact on wintering birds which currently use the survey area for foraging during the winter months.
- 15.175 In the longer term this proposed habitat creation may actually enhance the survey area for some of the bird species recorded during the wintering bird surveys. For example, the increase in woodland and scrub areas may be of benefit to notable wintering species, such as bullfinch, dunnock, redwing and song thrush. However, the loss of large areas of grassland within the survey area will have an adverse impact on some notable wintering species, such as kestrel, meadow pipit and yellowhammer.
- 15.176 The bird species recorded within the survey area during the winter surveys are considered to be of low (local) ecological value. Overall, some of the wintering bird species recorded within the survey will benefit and some will be adversely affected. The overall effects of the Proposed Development on wintering birds are considered to be **neutral and not significant**.

Badgers

- 15.177 Given that no badger setts have been recorded within 30 m of the Site and badgers are of negligible nature conservation value the impact on this species is **neutral and not significant**.

Water voles

- 15.178 Given that no evidence of water voles was found in Hermitage Stream and an assessment of the stream concluded that it was of low suitability for water voles, impacts during construction are not predicted. Re-alignment of the Hermitage Stream to create a more natural route will enhance the stream ecology and habitat and could provide potential opportunities for water voles to become established through natural colonisation, but it cannot be assumed that they would colonise. The impact on this species is **neutral and not significant**.

Otters

- 15.179 Given that no evidence of otters was found in Hermitage Stream and an assessment of the stream concluded that it was of low suitability for otters, impacts during construction are not predicted. Re-alignment of the Hermitage Stream to create a more natural route will enhance the stream ecology and habitat and could provide potential opportunities for otters to become established through natural colonisation, but it cannot be assumed that they would colonise. The impact on this species is **neutral and not significant**.

Operational Effects of the Proposed Development

Designated sites and Woodland

- 15.180 Following establishment of the new woodland planting and the habitat creation areas, operational activities would include the implementation of the management plan for Beech Wood East SINC.

The operational long term impacts on the SINC's and ancient woodland habitat are expected to be a **permanent beneficial effect of neutral significance**.

Grassland

- 15.181 Following establishment of the habitat creation areas the implementation of the management plan is expected to result in a **permanent beneficial effect of neutral significance**.

Hedgerows

- 15.182 The retained, translocated and new hedgerows would be maintained. Overall, the operational phase impact on hedgerows will be **neutral and not significant**.

Amphibians

- 15.183 Given that great crested newts are not currently present within 500 m of the Site, the operational phase impacts on this species is **neutral and not significant**.

Reptiles

- 15.184 The newly created and enhanced habitats would be maintained under the management plan. The implementation of the management plan is expected to result in a **permanent beneficial effect of neutral significance**.

Bats

- 15.185 As the habitat creation areas mature, foraging, commuting and roosting potential for bats would improve, but this would be compensation for the construction phase habitat loss. Traffic on the new roads could contribute to bat mortality. However, the commercial use proposed Site would mean that night time traffic would be less than daytime use during the seasons when bats are active. Risks of mortality are reduced further by planting of semi-mature trees to encourage bats to cross the road at a higher level, reducing the risk of collisions.
- 15.186 Lighting levels can adversely affect some bat species. Lighting will be required at each junction of the link road, as well as across the new business park. The designs of each area will aim to minimise light spill, but there will be areas of the Site that are less suitable for foraging bats. These would be localised and would not include the key areas of retained woodland, buffer habitat and other habitat creation areas. Therefore, the Site would still retain commuting and foraging opportunities for bats. Overall, it is considered therefore, that effects on bats would be **adverse of slight significance in the long term**.

Dormice

- 15.187 The newly created and enhanced habitats for dormice would be maintained under the management plan. The implementation of the management plan is expected to result in a **permanent beneficial effect of neutral significance**.

Breeding Birds

- 15.188 The newly created and enhanced habitats for breeding birds would be maintained under the management plan. The implementation of the management plan is expected to result in a **permanent beneficial effect of neutral significance**.

Wintering Birds

- 15.189 The newly created and enhanced habitats for common wintering birds would be maintained under the management plan. The implementation of the management plan is expected to result in a **permanent beneficial effect of neutral significance**.

Badgers

- 15.190 No badger setts have been recorded within 30 m of the Site and badgers are of negligible nature conservation value.

- 15.191 The additional buffer planting to woodland and habitat creation / enhancement area will benefit the badgers by providing foraging opportunities and also protect the existing main sett from disturbance. As badgers are of negligible nature conservation value the effect would be **neutral and not significant**.

Water Voles

- 15.192 The enhanced Hermitage stream would be maintained. There can be no assumption that water voles would colonise it, and therefore the effect would be **neutral and not significant**.

Otters

- 15.193 The enhanced Hermitage stream would be maintained. There can be no assumption that otters would colonise it, and therefore the effect would be **neutral and not significant**.

Consideration of Cumulative Effects

- 15.194 The nearest committed developments that could potentially affect the same ecological receptors as the Proposed Development are Havant Thicket winter storage reservoir immediately to the north-east of Park Lane Stream, and Ramsdale Playing Fields on Woolston Road immediately to the south east of the Proposed Development, which is for a residential development, school and associated public open space. The planning application for the reservoir has been delayed pending the review of the Southern Water's Resources Management Plan, and the construction of the Ramsdale Playing Fields development is currently underway.
- 15.195 Cumulative impacts on local receptors (i.e. impacts additional to those impacts that would result from the individual projects themselves) are not predicted. Potential cumulative impacts on internationally designated sites further away are dealt with in the Habitats Regulation Assessment Chapter of this ES (see Chapter 17).

Scoping Response

- 15.196 Cumulative Impact issues raised by respondents to the EIA Scoping Report are summarised in Table 15.8

Table 15.8 - Scoping Response - Cumulative Issues

Issue Raised	Respondent
Natural England has advised that the ES should identify, describe and evaluate the cumulative effects that are likely to result from the project. See list of major developments.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).
Strongly recommended that potential cumulative impact of the allocated development site for a reservoir at Havant Thicket are included.	

Summary

- 15.197 With proposed mitigation fully implemented, the significance of the overall residual effect is likely to range from **slight beneficial** to **slight adverse**. The overall residual effect of the scheme, taking mitigation into account, is assessed as being **neutral**.
- 15.198 The overall effects are summarised in Table 15.9 below.

Table 15.9 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Construction Effect	Description of Operational Effect	Description of Residual Effect
SINCs (mainly Cherry Tree Row, Beech Wood East, Neville's Park East Wood, and Neville's Park Areas 2&3)	Protection of SINCs using temporary fencing to minimise incursion. Establishment of buffer planting on the edges of all SINCs, habitat creation area and management plan.	neutral and not significant	permanent beneficial impact of neutral significance	Neutral
Grassland within fields proposed for route of site access link road.	Retained grassland will be incorporated into the landscaping design. New grassland habitat will be created that will include native grassland species characteristic of the local area and soil conditions	neutral and not significant	permanent beneficial impact of neutral significance	Neutral
Hedgerows, including three 'important' hedgerows under the Hedgerow regulation 1997	Retained hedgerows will be protected from damage during the construction period Replacement and supplementary hedgerow planting, with a larger total length of hedgerows and improved connectivity of isolated areas	neutral and not significant	neutral and not significant	Neutral
Amphibians	Enhancement through pond restoration and creation	permanent beneficial effect of neutral significance	neutral and not significant	A permanent beneficial effect of neutral significance
Reptiles	Risks of killing or injuring reptiles during site clearance would be minimised through the standard mitigation measures. Hibernation sites will be protected and created. Buffer planting and habitat creation will occur	permanent beneficial effect of slight significance	permanent beneficial effect of neutral significance	A permanent beneficial effect of slight significance
Bats	Strict measures would be followed to minimise any risk of harm to individual bats and roosts, with licences if roosts will be affected. Minimise light pollution. Strengthening of commuting corridors (hedgerows) and enhancement of woodland edges.	adverse effect of slight significance	adverse effect of slight significance in the long term	A permanent adverse effect of slight significance

Description of Environmental Resource	Mitigation	Description of Construction Effect	Description of Operational Effect	Description of Residual Effect
Dormice	Risks of killing or injuring dormice during site clearance would be minimised through the standard mitigation measures. Licence would be required. Overall increase in woodland habitat through buffer planting, hedgerow strengthening and enhanced connectivity.	Neutral and not significant	permanent beneficial effect of neutral significance	Neutral
Breeding birds	Vegetation clearance will be timed to avoid the breeding season where possible. If any vegetation is required to be removed during the breeding season an ecologist will carry out a nesting bird check prior to removal to ensure no nesting birds are disturbed. Habitat creation	neutral and not significant	permanent beneficial effect of neutral significance	Neutral
Wintering birds	Habitat creation	neutral and not significant	permanent beneficial effect of neutral significance	Neutral
Badgers	Standard measures such as covering open trenches at night and fencing woodland edges to avoid accidental incursion into the woodland where the sett is located. Buffer planting to protect woodland	neutral and not significant	neutral and not significant	Neutral
Water voles	Re-alignment of the Hermitage Stream to enhance the stream ecology and habitat	neutral and not significant	neutral and not significant	Neutral
Otters	Re-alignment of the Hermitage Stream to enhance the stream ecology and habitat	neutral and not significant	neutral and not significant	Neutral

References

- 15.1 Rodwell J. S. (ed.) (1992) British Plant Communities Volume 3: Grasslands and montane communities. Cambridge University Press.
- 15.2 Cranfield. J., (2002) Dunsbury Hill Farm Herpetological Survey.
- 15.3 Froglife (1999) Reptile survey : an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.
- 15.4 Bright, P., Morris, P & Mitchell-Jones, T. (2006). 'Dormouse Conservation Handbook. Second Edition'. English Nature, Peterborough.
- 15.5 Battersby (Edited and compiled, 2005). UK Mammals: Species status and population trends (2005).
- 15.6 Wildlife and Countryside Act (1981)
- 15.7 BARS (2010) 'Biodiversity Action Reporting System' (WWW), (<http://www.ukbap-reporting.org.uk>: accessed 26th July 2011).
- 15.8 Eaton, M.A., Brown A.F., Noble D.G., Musgrove, A.J., Hearn R.D., Aebischer N.J., Gibbons D.W., Evans A., and Gregory R.D. (2009) Birds of Conservation Concern 3: The population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102: 296-341.
- 15.9 Council Directive 79/409/EEC on the conservation of wild birds (the 'Birds Directive'). The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. Annex 1 of the Directive lists vulnerable species for which Special Protection Areas (SPA) can be designated. In the UK the Directive has been transposed into national laws by means of the Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations).
- 15.10 JNCC (2006) Natura 2000 Standard Data Form for Special protection Areas: Portsmouth Harbour. JNCC: Peterborough.
- 15.11 Blunden. A. (2002) Water vole survey: Dunsbury Hill near Havant. EPR.

16 Waste and Recycling

Introduction

- 16.1 The generation of waste, in one form or another, is an inevitable consequence of all forms of development and the sustainable management of waste is an important issue. The purpose of this section of the environmental chapter is to provide a prediction of the amount of waste that is envisaged as a result of the Proposed Development and assess the impacts of this waste on the environment.

Scoping Response

- 16.2 Waste and recycling issues raised by respondents to the EIA Scoping Report are summarised in Table 16.1

Table 16.1 - Scoping Response - Waste and Recycling Issues

Issue Raised	Respondent
With regard to waste and Recycling, this section should include reference to the National Waste Strategy for England 2007.	Steve Weaver, Interim Development Services Manager, Havant Borough Council (comment as at 02 Nov 2011 to the original Scoping Report).

Key Aspects of the Project

- 16.3 The Proposed Development will result in the construction of over 46,450 m² of employment floor space provided in the following proportions: B8 (storage and distribution) 20%; and B1 (business) and B2 (general industrial) 80%. The employment floorspace may include small areas of ancillary uses such as canteens and gyms which will be required to support the Site, and may be provided as part of the employment development. In addition the Proposed Development will include 5,574 m² of hotel floor space. Phase 2 comprises 7 ha and could provide an additional 15,329 m² of new employment floorspace and would be located in northern section of the Site.
- 16.4 The construction of the Proposed Development (and any later decommissioning), including the excavation of material for groundworks and the construction of Sustainable Urban Drainage Systems (SUDS) will result in the generation of a variety of non-hazardous and hazardous construction and demolition wastes such as aggregates, concrete, metal, wood and soils.
- 16.5 The operational phase of the development will generate both non-hazardous and hazardous waste through a variety of activities. The type of waste produced will be highly dependent on what form these activities take, as business and industrial uses can be highly variable. It can be expected however that the majority of waste will be general waste resulting in a composition of mostly paper and cardboard, organic food waste, wood, metal, plastic and bulky wastes. Ancillary uses such as canteens or similar food and beverage facilities will result in higher volumes of waste with a greater proportion of organic food waste.
- 16.6 Wastes during the construction (and decommissioning) phase can be mitigated through design which utilises construction methods such as off site fabrication and cut fill balances for excavations and good construction waste management. This can include using on site crushers and screens, allocating skips to separate waste streams, toolbox talks to relay good waste management - procedures to contractors and developing Site Waste Management Plans (SWMP) as required in the Site Waste Management Plan Regulations 2008. These will help identify the wastes arising from construction activities and how best to manage them to minimise their environmental impact.

- 16.7 It is expected that much of the waste impacts during the operational phase can be mitigated through the provision of separate recycling containers, recycling collections, education programmes for tenants and the establishment of small scale industrial symbiosis programme on the Site to establish whether any waste from one tenant can be used as a resource by another tenant.
- 16.8 By adopting the principles of good waste management practice (reduce, reuse and recycle), it is possible for a high recycling and recovery rate to be achieved therefore minimising the quantity of waste produced or sent to landfill and the environmental burden in terms of pollution, energy and carbon impact associated with the production of products from virgin material.

Relevant Legislation, Policies and Guidelines

Legislation

Waste Framework Directive

- 16.9 Government policy on waste is primarily driven by a number of important European Directives. Most notably, the consolidated Waste Framework Directive (Council Directive 2006/12/EC) which draws together text from the previous 1991 Waste Framework Directive, as previously amended.
- 16.10 'Waste' is defined in Article 1(a) of the Waste Framework Directive (Council Directive 75/442/EEC) as *"...any substance or object...which the holder discards or intends or is required to discard."*

The Landfill Regulations 2002

- 16.11 The Landfill (England and Wales) Regulations 2002 implement the Landfill Directive (Council Directive 1999/31/EC), into domestic legislation. The effect of the regulations on historical waste management practices in the UK has been notably significant. Perhaps the most significant impact is the introduction of three progressive targets for the UK to reduce the amount of biodegradable municipal waste (BMW) sent to landfill for disposal to:
- 75% of total amount of BMW produced in 1995 by 2010;
 - 50% of total amount of BMW produced in 1995 by 2013; and
 - 35% of total amount of BMW produced in 1995 by 2020.

Waste Electrical and Electronic Equipment (WEEE) Regulations 2006

- 16.12 A key objective of the WEEE Regulations is to reduce the amount of WEEE that goes to landfills, which is intended to be achieved by producers being required to finance the collection, treatment and recovery of WEEE.
- 16.13 WEEE Regulations also place an obligation on distributors to offer to consumers a take back system where WEEE items can be disposed of free of charge.
- 16.14 Businesses and other users of EEE must ensure that all separately collected WEEE are treated and recycled. Depending on the circumstances, the cost would be borne by either the business or the producer of such goods.

The Waste Batteries and Accumulators Regulations 2009

- 16.15 The main requirements set out in the regulations are that producers of batteries and accumulators must either take back waste batteries and accumulators or fund the collection and recycling of them.
- 16.16 These requirements were set in order to meet collection targets of 25% by 2012 and 45% by 2016.
- 16.17 Waste batteries produced by businesses need to be collected either by the same contractors which collect WEEE (as detailed above) or another specialised waste collection contractor.

Policy

National Policy

- 16.18 Policy and guidance arising from most of these Directives (and their predecessors) and other related European legislation was drawn together in the Government's 'Waste Strategy 2007' (originally published by the Department for Environment, Food and Rural Affairs (DEFRA), May 2007). The Waste Strategy 2007 (WS 2007) builds upon the Waste Strategy 2000 (WS 2000). The WS 2007 is currently undergoing an update which is expected to either replace or revise the existing WS 2007. It is expected that this will be published in the Spring/Summer of 2011 and review existing policy in order for England to become a zero waste society.
- 16.19 WS 2007 sets out the changes required in England and Wales to deliver more sustainable development and emphasises that where waste is created it must be put to good use and managed according to the over arching principles of; the Waste Hierarchy (reducing waste, increasing re-use and recycling and minimising landfill); the Best Practical Environmental Option; the Proximity Principle; and Self Sufficiency. Its main proposals are to:
- Incentivise efforts to reduce, recycle, reuse and recover energy from waste;
 - Reform regulation of waste to drive the minimisation of waste and reduction of waste to landfill;
 - Secure the investment in infrastructure to drive the diversion of waste from landfill and for the management of hazardous waste; and
 - Get the most environmental benefit from that investment, through increased recycling of resources and energy recovery from residual waste using a mix of technologies.
- 16.20 The updating of WS 2000 was initiated (in 2004) when Government guidance on the relationship between waste management and the land use planning system was revised to bring it into line with the requirements of the Planning and Compulsory Purchase Act, 2004. This revised guidance took the form of 'Planning Policy Statement 10: Planning for Sustainable Waste Management', July 2005 (PPS 10), with accompanying guidance.
- 16.21 PPS 10 forms part of the national waste management plan (national strategy for waste) and its policies should be taken into account by waste management authorities in discharging their statutory responsibilities, by the Mayor of London in the Spatial Development Strategy and by local planning authorities in preparing local development documents. The policy refers to the duties placed upon waste planning authorities. These are authorities with responsibility for land-use planning control for waste management. Key waste planning objectives are:
- Make waste a resource to be used rather than disposed of;
 - Make communities responsible for managing their own waste;
 - Meet national waste strategy and EU obligations for reducing waste and its impact upon the environment;
 - Enable the safe, healthy and environmentally acceptable handling of waste;
 - Balance the community's concerns about waste management with the needs of communities and business for waste management;
 - Promote technological advance and good design in sustainable waste management; and
 - Protect the environment and major sensitive areas like the Green Belt whilst recognising that some waste management options can be accommodated in such locations.
- 16.22 'Planning Policy Statement (PPS) 23: Planning and Pollution Control' states that, where possible, waste should be disposed of, or otherwise managed, close to the point at which it is generated.

Waste should only cross regional/ county boundaries if that represents the most sustainable option, for example where the distance is short or where the waste requires treatment or disposal at a specialist facility.

Local Policy

- 16.23 The South East Plan (2009) sets out a vision for the future of the South East region up to 2026. It contains a number of key policies relating to housing, economy, transport and the protection of the environment which includes waste. The relevant policies to waste are discussed below:
- CC1 Sustainable Development - A key objective of the plan is to achieve and maintain sustainable development in the region. This includes sustainable levels of resource use, ensuring the physical and natural environment of the South East is enhanced and reducing greenhouse gas emissions. In terms of waste this may mean encouraging recycling and reuse and moving away from unsustainable practices of waste management such as landfill disposal.
 - CC3 Resource Use - The key principles are to increase the efficiency of resource use in development, adapt existing development to reduce energy, water and other resource use and change behaviours by organisation and individuals. An indication is made to a movement towards sustainable construction, using more recycled materials and producing less waste per unit.
 - CC4 Sustainable Design and Construction - The design and construction of new developments and the refurbishment and redevelopment of existing buildings are expected to adopt principles relating to sustainable design and construction. This includes the increased recycling and reuse of construction and demolition waste materials as well as the use of low impact materials in construction (which can include recycled aggregate) and the minimisation of waste.
 - Policy W2: Sustainable Design, Construction and Demolition - Development plan documents will require the adoption of sustainable, design and construction methods into the development framework. This will include the reuse of construction and demolition material and the promotion of layouts and designs which provide adequate space to facilitate the storage, reuse, recycling and composting of waste materials.
 - Policy W6: Recycling and Composting - Sets out the targets for recycling and recovery which should be achieved in the region. These are set out in the Table below.
- 16.24 Havant's Core Strategy, adopted March 2011, sets out the planning framework for the Borough up until 2026. The key policy relevant to waste is:
- CS16 High Quality Design - Sets out the design standards required to achieve planning permission. This includes that all development should demonstrate its design mitigates negative environmental impacts through sustainable design and construction methods, resource efficiencies, and the provision of facilities for waste recycling.

Approach to Assessment

- 16.25 The approach to the assessment of waste management on the proposed development has been to assess the likely types and volumes of waste generated for each of the following lifecycles:
- Construction;
 - Operation; and
 - Decommissioning.
- 16.26 An assessment has been made of the different waste quantities and material types using standard indices at the construction and operational phase for the different proposed land uses and floor areas.

- 16.27 The quantity has then been assessed against the existing waste collection, recycling and disposal infrastructure in Hampshire County Council area.
- 16.28 Although only construction and operation are often considered for assessment, it is important to recognise that all developments have a finite life. As such, consideration has been made of the waste likely to arise at the end of the development's life.

Assessment of Impact and Significance

- 16.29 The estimated construction waste arisings from the Proposed Development have been calculated based on data compiled from the Building Research Establishments (BRE), for the construction of new build projects in the United Kingdom. These benchmarks were based on the construction phase only and do not include demolition, excavation or ground works waste.
- 16.30 Based on the latest BRE values (April 2011) average construction waste generation rates have been calculated per 100 m² of floor area (Reference 16.1). As there is currently minimal data on the building layouts these values have been used in conjunction with the areas allocated to each of the main landuses, i.e. B8; storage and distribution, B1; business, B2; general industrial and the Hotel to quantify indicative values for construction waste arisings. These landuses have been allocated to the closest available type from the BRE indices i.e. classified as either commercial office, leisure (hotel) or industrial land uses.
- 16.31 Waste arisings have been calculated based on the following assumptions:
- 27.8 tonnes of waste will be produced per 100 m² of floor area for commercial office projects;
 - 17 tonnes of waste will be produced per 100 m² of floor area for industrial projects; and
 - 31.1 tonnes of waste will be produced per 100 m² of floor area for leisure projects (including hotels).
- 16.32 It is expected that excavated material will be reused in a cut/fill balance for landscaping purposes and has therefore not been included in the calculations.
- 16.33 For operational waste, as there is minimal information on the type of businesses and industries which will operate on Site, it has been assumed for the purposes of the calculations that the majority of waste will be generated at a rate equivalent to commercial office developments, light industry or hotel. Waste arisings are deemed as commercial or light industry in nature and similar to municipal waste in composition.
- 16.34 Operational waste has been calculated based on the following standard waste indices:
- 0.005 m³/m² per week for commercial office areas;
 - 0.005 m³/m² per week for industrial areas; and
 - 0.25 m³ per bed per week for the hotel (assumes 2/3 star hotel)
- 16.35 The estimated operational waste arisings will be compared with the total amount of waste produced within Havant Borough Council and Hampshire County Council to provide context.

Baseline Conditions

- 16.36 The Site is currently undeveloped and as such there is no waste generated. Therefore all waste generated on the Site will present an increase from the baseline.
- 16.37 According to the most readily and recently available data for 2002/03, Hampshire generated approximately 2,148,000 tonnes of construction, demolition and excavation waste a year and 1,468,000 tonnes of commercial and industrial waste.

Identification and Assessment of Likely Effects

Construction Waste

- 16.38 To calculate construction waste, indices have been applied to each land use type as appropriate. Based on these calculations it is estimated that the construction of the Proposed Development will generate approximately 12,640 tonnes of construction waste in Phase 1 and 4,261 tonnes in Phase 2. A summary of the calculations is shown in Table 16.2

Table 16.2 - Construction Waste Arisings for Phase 1

Land Use	Total Area (m ²)	Average tonnes/100 m ²	Construction Waste Tonnes
B8; storage and distribution, B1; business	23,870	27.8	6,636
B2; general industrial	18,580	17	3,159
Hotel	5,574	31.1	1,734
Enterprise Centre*	4,000	27.8	1,112
Total	52,024		12,640

*Assumed to be a part of the B1 proportion of the overall waste area.

Table 16.3 - Construction Waste Arisings for Phase 2

Land Use	Total Area (m ²)	Average tonnes/100 m ²	Construction Waste Tonnes
Phase 2	15,329	27.8	4,261
Total	15,329		4,261

- 16.39 In addition to the material above there will also be waste generated during the construction of the road, however this is likely to be relatively minimal in comparison to the full construction waste shown above. It is also anticipated that the construction of the road will utilise some of the excavated soil generated from levelling the site and constructing the SUD's.
- 16.40 This waste volume can be compared to the existing construction waste arisings in Hampshire as detailed above. Based on the figures above the Proposed Development will result in the production of an additional 0.6 % of waste requiring disposal in the region for phase 1 and 0.2% in phase 2.
- 16.41 To mitigate the impact of this additional waste good construction management practices should be followed. These could include:

Good Practice

- Creative approaches to identify the potential for use of non-primary materials in higher value applications;
- Encouraged use of non-primary materials over primary materials; and
- Encouraged use of site-won material over imported materials.

Contractor practice

- Support for waste minimisation and recycling initiatives - setting KPI's; and
- Resource sustainability and reuse of non-primary materials will be recognised as an element in lean construction methodologies.

Specifications

- Preference could be given to renewable materials, materials with low(er) environmental impacts and to components with high(er) proportions of recycled material; and
- Preference could be given to the fabrication of structural components off-site.

Handling of Materials

- Contractors should develop a Site Waste Management Plan (SWMP), in accordance with regulations, to identify responsibilities, waste streams and plan for efficient materials and waste handling;
- Materials to be segregated/ graded and where possible processed on site to facilitate re-use and minimise generation of waste and demand for primary materials; and
- Site materials to be quantified and categorised in order to identify options for recycling and re-use versus disposal.

- 16.42 Using the mitigation measures above and the appointment of a licensed and high performing waste contractor should help enable the project to achieve high recycling values which would reduce the waste requiring disposal by at least 60%.
- 16.43 Based on the existing waste disposal capacity in the region the additional waste would have a temporary **minor adverse** impact.

Operational Waste

- 16.44 Based on calculations it is estimated that approximately 2,153 tonnes (14,353 m³ at density of 150 kg/m³) of operational waste will be generated from the development per year for phase 1 and 598 tonnes (3,985 m³ at density of 150 kg/m³) per year for phase 2. Operational waste quantities are summarised in the tables below.

Table 16.4 - Operational Waste Arisings Phase 1

Land Use	Total Area (m ²)	Average m ³ /m ² of Waste per Week	Operational Waste Volume (m ³ /pa)	Operational Waste (tpa)
B8; storage and distribution, B1; business and B2; general industrial	46,450	0.005	12,077	1,812
Hotel*	5,574 (95 rooms)	0.25 (per room)	1,235	185
Enterprise Centre	4,000	0.005	1,040	156
Total			14,352	2,153

Table 16.5 - Operational Waste Arisings Phase 2

Land Use	Total Area (m ²)	Average m ³ /m ² of Waste per Week	Operational Waste Volume (m ³ /pa)	Operational Waste (tpa)
Phase 2	15,329	0.005	3,985	598
Total			3,985	598

- 16.45 It is estimated that the waste from the offices, light industrial areas and canteen will result in a composition of mostly organic food waste, paper, cardboard, plastic, metal, glass and bulky wastes. A typical composition for waste in Hampshire has been used in Table 16.5 and is assumed to be representative of the waste arising at the development. The proportion of waste has been calculated based on information in the tables above.

Table 16.6 - Waste Composition Phase 1

Waste Type	Composition	Volume (tpa)
Paper and Card	33%	908
Organic	30%	825
Plastics	13%	358
Metals	5%	138
Textiles	5%	138
Glass bottles/jars	4%	110
Miscellaneous	10%	275
Total	100%	2,751

Table 16.7 - Waste Composition Phase 2

Waste Type	Composition	Volume (tpa)
Paper and Card	33%	197
Organic	30%	179
Plastics	13%	78
Metals	5%	30
Textiles	5%	30
Glass bottles/jars	4%	24
Miscellaneous	10%	60
Total	100%	598

- 16.46 Comparing the estimated waste quantities above to those known for the industrial and commercial sector in Hampshire shows that phase 1 will generate 0.1% additional waste and phase 2 will generate 0.04% additional waste.
- 16.47 To mitigate the impact of the operational waste generation the following steps can be taken:
- Consideration should be given where possible to, deliveries to the canteens being made in re-useable/ returnable containers so as to reduce packaging waste;
 - Provision of clearly labelled and colour-coded bins for recycling and disposal to encourage visitors to segregate waste over purely throwing it away;
 - Provision of recycling facilities within the Proposed Development (i.e. card compactors, wood chippers/ pelletizers, etc); and
 - Set requirements for tenants to reach a certain recycling rate and provide education to their staff on recycling and waste reduction.
- 16.48 With this mitigation in place waste requiring disposal should be reduced by at least 50%.

- 16.49 Waste may well be the highest in year one and year 15 when new tenants move to the Site and generate waste from packaging etc and also as they will not have any established waste management procedures.
- 16.50 Based on the existing waste disposal capacity in the region the additional waste would have a permanent **minor adverse impact**.

Decommissioning Waste

- 16.51 A summary of the calculations for waste generated from decommissioning is shown in Table 16.8. This will be of construction waste in type and consist of mostly inert waste.

Table 16.8 - Decommissioning Waste Arisings

Land Use	Total Area (m ²)	Decommissioning Waste Volume (tonnes)
B8; storage and distribution, B1; business (including enterprise centre) and B2; general industrial	46,450	130,976
Hotel	5,574	15,717
Phase 2	46,450	130,976
Total	67,353	189,916

- 16.52 It is estimated that the decommissioning of the Proposed Development will generate approximately 189,916 tonnes of construction type waste. If similar mitigation measures as those proposed for construction waste are implemented (such as onsite segregation of materials and site waste management plans) it is likely that this will be able to reduce the volume of waste requiring disposal by at least 60%.
- 16.53 If all the proposed mitigation measures are adopted the residual effects can be summarised as follows:
- Assuming a 60% recycling rate is achieved 6,760 tonnes of additional construction waste will be produced. This is 0.31% of the volume produced in Hampshire (Reference 16.2) and 1.04% of the regions planned annual inert landfill space in 2020 (Reference 16.3);
 - Assuming a 50% recycling rate is achieved 1,376 tonnes per annum of additional operational (commercial and industrial type) waste will be produced. This is 0.09% of the current volume produced in Hampshire (Reference 16.2) and 0.44% of the regions planned annual non hazardous landfill space in 2020 (Reference 16.3) and
 - Assuming a 60% recycling rate is achieved 75,966 tonnes of additional decommissioning (construction type) waste will be produced. This is 3.54% of the volume produced in Hampshire (Reference 16. 2) and 11.76% of the regions planned annual inert landfill space in 2020 (Reference 16. 3).

Summary

- 16.54 The Proposed Development will result in the generation of 16,901 tonnes of construction waste and 2,751 tonnes per annum of commercial and industrial waste. If good recycling practices are adopted it will be possible to reduce the volumes of waste by at least 60% for construction and demolition waste and at least 50% for operational waste. This will reduce the impact of the waste on the existing waste treatment capacity in Hampshire and the associated environmental impacts. As the waste produced is minimal in comparison to the overall waste arisings in Hampshire and the available treatment capacity it is expected that the Proposed Development will result in a **minor** impact in terms of waste.

- 16.55 It is noted that the decommissioning waste may be a higher percentage of the planned annual inert landfill space however this can be mitigated by working towards a higher best practice recycling and recovery rate of 90%. This is readily achievable with good management practices and planning and will reduce the impact on the annual capacity to 2.94%
- 16.56 A summary of the assessment of the impact of waste from the development is set out in the Table below.

Table 16.9 - Assessment Summary

Description of Environmental Resource	Mitigation	Description of Residual Effect
Construction		
Waste Treatment Capacity	Adopting designing out waste principles, recycling measures such as on site segregation of materials and adoption of Site Waste Management Plans.	Minor adverse
Operation		
Waste Treatment Capacity	Adopting recycling, providing appropriate provision for recyclables on site, staff education programmes.	Minor Adverse
Decommissioning		
Waste Treatment Capacity	Adopting recycling measures such as on site segregation of materials and adoption of Site Waste Management Plans. Aiming for a best practice recovery rate of circa 90%	Minor Adverse

References

- 16.1 Building Research Establishment, (2011), 'Waste Benchmarks for New Projects by Project Type April 2011.
- 16.2 Most recent and readily available figures 2002/03.
- 16.3 Hampshire Minerals and Waste Core Strategy (2007).

17 Information for Habitats Regulations Assessment

- 17.1 As mentioned in the Introduction of this ES, Habitats Regulation Assessment (HRA) is required by Regulation 61 the Conservation of Habitats and Species Regulations 2010 (the Habitat Regulations) for all plans and projects which may have likely significant effects on European sites and are not directly connected with or necessary to the management of the European site.
- 17.2 European sites include Special Areas of Conservation (SAC), Special Protection Areas (SPA), and European Marine Sites (EMS, which is a collective term for SACs and SPAs that are covered by tidal water). HRA is also required, as a matter of UK Government policy for potential SPAs (pSPA), candidate SACs (cSAC) and listed Wetlands of International Importance (Ramsar sites) for the purposes of considering plans and projects, which may affect them (Reference 18.1). Hereafter all of the above designated nature conservation sites are referred to as 'international sites'.
- 17.3 The stages of HRA process are:
- **Stage 1 – Screening:** To test whether a plan or project either alone or in combination with other plans and projects is likely to have a significant effect on an international site;
 - **Stage 2 – Appropriate Assessment:** To determine whether, in view of an international site's conservation objectives, the plan (either alone or in combination with other projects and plans) would have an adverse effect (or risk of this) on the integrity of the site with respect to the site structure, function and conservation objectives. If adverse impacts are anticipated, potential mitigation measures to alleviate impacts should be proposed and assessed;
 - **Stage 3 – Assessment of alternative solutions:** Where a plan is assessed as having an adverse impact (or risk of this) on the integrity of an international site, there should be an examination of alternatives (e.g. alternative locations and designs of development); and,
 - **Stage 4 – Assessment where no alternative solutions remain and where adverse impacts remain:** In exceptional circumstance (e.g. where there are imperative reasons of overriding public interest), compensatory measures to be put in place to offset negative impacts.
- 17.4 A Habitats Regulations Assessment Stage 1 - Screening exercise has been undertaken for this project and has been reported separately in **Appendix 15.1, Volume 3** of this ES. The Screening report focused on possible likely significant effects of the Dunsbury Hill Farm project on the following seven international sites, as agreed with Natural England:
- Chichester and Langstone Harbour SPA;
 - Chichester and Langstone Harbour Ramsar site;
 - Portsmouth Harbour SPA;
 - Portsmouth Harbour Ramsar site;
 - Solent Maritime SAC;
 - Solent and Isle of Wight Lagoons SAC; and
 - Butser Hill SAC.

- 17.5 During the Stage 1 – Screening of the Project, possible sources of adverse effects on the international sites considered in this assessment due to construction and/or operation of the proposed development at Dunsbury Hill included:
- A change in air quality during construction and operation of the site;
 - A change in water quality or regime within the international sites during construction and operation of the site;
 - A change in noise levels during construction and operation so that there is increased disturbance within the international sites;
 - An increased level of visual disturbance to birds using the international sites;
 - An increase in litter and debris entering the Hermitage Stream and thus the international sites during operation of site; and
 - Increased levels of recreational activity;
 - In-combination effects from other Projects in the area.
- 17.6 The assessment found none of the possible sources outlined above are predicted to have or risk contributing to a likely significant effect on the international sites (see Section 6 above).
- 17.7 The study showed that there are no likely significant effects on the international sites considered in this Stage 1 - Screening due to construction and/or operation of the Dunsbury Hill Farm development alone or in combination with other plans and projects, and that there is therefore no requirement for any further stages of the HRA process (i.e. Stage 2 - Appropriate Assessment) to be completed.

References

- 17.1 Planning Policy Statement 9: Biodiversity and Geological Conservation, ODPM (August 2005)

18 Cumulative Effects

Introduction

- 18.1 Sections 6 to 17 of this ES set out the findings of the EIA for a range of environmental topics, and in particular, ascertain the likely significance of identified effects. Receptors may be impacted by more than one environmental effect; whilst individually, the effects may be within accepted limits, collectively, the effects may be more significant. At the same time, potential effects associated with the proposed development may be acceptable in isolation, but when considered in the context of other development coming forward, may become more significant. This section addresses those 'cumulative' effects.

Regulatory Context

- 18.2 The 2011 Regulations require an ES to include, amongst other things: "A description of the likely significant effects of the development on the environment, which should cover the ... cumulative ... effects of the development." (Schedule 4, Part 1, Para 4).
- 18.3 Paragraph 3 requires "a description of the aspects of the environment likely to be significantly affected by the development including ... [the environmental topics] ...and the interrelationship between the above factors".
- 18.4 Circular 02/99 (para 46) confirms that in judging whether the effects of a development are likely to be significant, regard should be had to "the possible cumulative effects with any existing or approved development. There are occasions where the existence of other development may be particularly relevant in determining whether significant effects are likely or even where more than one application for development should be considered together to determine whether or not EIA is required."
- 18.5 The Circular states that the information required by Part I of Schedule 4 should be provided to the extent that "is reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile" (Circular 02/99 para 81).

Methodology

- 18.6 Each technical chapter considers cumulative effects where relevant within its discipline, a summary of these effects is included in Tables 19.1 and 19.2. In accordance with the 2011 Regulations, this Section of the ES therefore considers the main interactions between the environmental topics that form part of the EIA and also considers the possible cumulative effects with other existing or approved developments.
- 18.7 The EIA team has considered carefully the need for cumulative impact assessment. The impact of additional traffic on the road network arising from existing and approved development, together with an estimate of the development proposed in the Havant Borough Core Strategy likely to be built by 2026, is taken into account in the transport modelling and therefore reflected in the transport, air quality and noise and vibration assessments.
- 18.8 In respect of the impact assessments relating to land use (agriculture), socio-economics, cultural heritage, ground conditions, water resources and flood risk, landscape and visual effects and ecology, there are no existing or approved developments that are likely to have cumulative effects when considered alongside the effects of the Proposed Development.
- 18.9 The EIA does consider effects of the Proposed Development on the environment beyond the study area when appropriate – for example on the nearby SINCS.

- 18.10 Accordingly this section summarises cumulative impacts on individual receptors in respect of transport, air quality and noise and vibration.

Interactions between Effects

- 18.11 Individual technical chapters within this ES have considered cumulative effects at scales appropriate to that technical discipline, agreed in consultation with relevant consultees. Considering cumulative effects between disciplines inevitably means considering effects which operate at different spatial and temporal scales and consistency of approach is difficult to achieve.
- 18.12 Disciplines that could result in interactions include: transport, air quality and noise (which is addressed below under cumulative effects with committed development); and ecology, air quality and noise.
- 18.13 The cumulative effects of the identified impacts on the same receptors have been considered. Due to the predicted imperceptible changes in traffic noise and air quality it is not considered that there would be a likely significant effect of noise and air quality on residential or ecological receptors.

Cumulative Effects with Committed Developments

- 18.14 The HBC EIA Scoping Opinion (18th April 2011) provided a list of major development to help determine which developments could potentially give rise to significant cumulative impacts. In addition the potential Havant Thicket Reservoir project is identified in the Core Strategy (Policy CS18) as a strategic site and is approximately 600m from the Site.
- 18.15 The specialists have considered the list of major developments and it is considered that due to the scale and nature of these developments and their distance from the Site, there are no other consented schemes which might contribute to an assessment of cumulative effects.
- 18.16 The nearest committed developments that could potentially affect the same ecological receptors as the Proposed Development are Havant Thicket winter storage reservoir immediately to the north-east of Park Lane Stream, and Ramsdale Playing Fields on Woolston Road immediately to the south east of the Proposed Development, which is for a residential development, school and associated public open space. The planning application for the reservoir has been delayed pending the review of the Southern Water's Resources Management Plan, and the construction of the Ramsdale Playing Fields development is currently underway.
- 18.17 The HRA Screening study (see Chapter 17) concluded that there are no likely significant effects on the international sites considered due to construction and/or operation of the Proposed Development alone or in combination with other plans and projects, and that there is therefore no requirement for any further stages of the HRA process (i.e. Stage 2 - Appropriate Assessment) to be completed.

Transport and Accessibility

- 18.18 However, the cumulative effects arising from additional traffic on the road network are woven into the impacts reported in Chapter 8 and used to inform the air and noise assessments. This traffic modelling includes all key committed developments and an estimate of developments detailed within the HBC Core Strategy likely to be built by 2026.
- 18.19 The Transport assessment work concludes that the scale of the Proposed Development will result in some impact on queues and delays in the local road network. These impacts are offset to some extent by the significant improvements to the public transport network that would be facilitated by the Site with the Cross Borough Service.

- 18.20 A package of on and off site measures are proposed to improve the local transport infrastructure so as to adequately mitigate the impact of any residual traffic associated with the Proposed Development.
- 18.21 Financial contributions towards improvements to the public transport network, including the provision of a bus service and bus priority, together with improved linkages for cyclists and pedestrians, will provide substantial benefits for existing Havant residents and future users of the Proposed Development.
- 18.22 The implementation of the proposed construction strategy will ensure that construction traffic and access to the development is properly managed so as to minimise any impact it may have on the existing road network.
- 18.23 The air quality and noise assessments are based on the same traffic figures and conclude that there would be imperceptible changes in traffic noise levels and air quality from the increased operational traffic.

Summary and Conclusions

- 18.24 This consideration of cumulative effects has determined that there are no interactions between the environmental topics that form part of the EIA that are likely to result in a significant effect on a single receptor.
- 18.25 It has also confirmed that there are no relevant Core Strategy site allocations or consented schemes which might contribute to an assessment of cumulative effects save in respect of transport modelling. The EIA has concluded that the moderate increase in traffic flows will lead to imperceptible changes in traffic noise and air quality.

19 Summary

Introduction

- 19.1 The primary purpose of an ES is to gather, assess in a systematic manner and collate information on the anticipated significant effects of a proposal on the environment, in order that this information can be properly taken into account by the planning authority before a decision on the proposals is made. This exercise has been undertaken in the previous sections of the ES, and in this section the information is brought together in tabular form for ease of access. Reference should be made to the individual sections of this Volume 1 of the ES, and where appropriate to the specialist reports in Volume 3, for full and detailed information.

Summary of Potential Effects and Significance

- 19.2 Table 19.1 below summarises the temporary impacts associated with construction activities and potential mitigation measures. The residual significance assignment (fourth column) relates to the worst case referred to in the topic assessment and is, thus, a conservative representation of the potential impacts.

Table 19.1 - Temporary Impacts and Assessment of Significance

Topic	Temporary Impacts	Mitigation	Residual Assessment
Land Use	Land take of 39 ha of agricultural land. Not the best and most versatile category.	Soil Handling and Management Strategy as part of the CEMP.	<i>Minor Adverse</i>
	Termination of tenancies with local farm businesses	No mitigation required: the land is let on short-term arrangements.	<i>Minor Adverse</i>
Socio-Economic Considerations	Employment creation - temporary jobs during the four year construction period. Creation of 844 direct construction jobs plus 245 indirect / induced jobs at a local level and 371 at a regional level.	Partnership working between local training and skills providers, construction firms and the developer will allow more local people to acquire the skills necessary to take advantage of the jobs created during the construction of the scheme.	<i>Moderate Beneficial</i>
Transport & Accessibility	Highway network under construction	CEMP will be put in place to reduce any negative impact from the construction traffic.	<i>Minor Adverse</i>
Air Quality	Construction dust can cause nuisance effect	Mitigation measures would be included in the CEMP to reduce dust emissions.	<i>Neutral</i>
	Construction traffic	CEMP will address any negative impact from the construction traffic.	<i>Neutral</i>

Topic	Temporary Impacts	Mitigation	Residual Assessment
Noise and Vibration	Noise from the construction of the roads and plots could impact on noise sensitive receptors.	Appropriate noise barriers positioned close to the source of the noise could reduce the noise by 10dB. Distance between the source and receptor and position of equipment. Reducing noise at source, by fitting silencers/mufflers where possible. Keeping the equipment in good working order. Shutting down machines in intermittent use. Good communication with affected residents. CEMP in place to reduce any negative impact from the construction traffic.	<i>Minor or Moderate</i> (where mitigation not possible or effective) <i>Adverse</i>
	Vibration from the construction of the roads and plots could impact on noise sensitive receptors.	Avoiding percussive piling within 40m of a property. Good communication with affected residents.	<i>Minor Adverse</i>
Cultural Heritage	Currently unknown archaeological remains within the Site	Impacts cannot be determined and consequently an archaeological research programme will be embedded into the construction process. Standards of the excavation to adhere to local County Council requirements and to the Standards and Guidance of the Institute for Archaeologists.	<i>*Not Significant</i> (<i>Minor Adverse</i>)
Ground Conditions and Contaminated Land	Small pockets of contaminated land may be present within the Site.	Expected contamination, if any, is expected to be easily treated/removed during the construction period.	<i>Minor Adverse</i>
Water Resources and Flood Risk	Water environment	Good construction management practices to minimise the risk of pollution to controlled waters. Development of a sediment erosion management plan	<i>*Neutral</i> (<i>Minor Adverse</i>)

Topic	Temporary Impacts	Mitigation	Residual Assessment
		(pre-construction) and adoption of CEMP.	
Landscape and Visual Assessment	Construction of Link Road and built form of masterplan visible from existing footpaths and bridleway, most notably No123, and from dwellings on Calshot Road, Ramsdale Road and the Woolston Road development.	Screen planting within the Site will integrate the new buildings into the existing views. Rooflines should be below the tree line and reduced for Phase 2 for elevated parts of the site.	<i>Minor Adverse</i>
	Minor loss of vegetation and impact upon the character of the landscape	Integration of the proposed built form with new landscape structure comprising a series of green fingers combined strengthening of the existing landscape structure.	<i>Negligible</i>
	Loss of mature Oak/Ash trees	Replant with semi-mature oak/ash specimens as part of the wider landscape.	<i>Minor Adverse</i>
	Construction of Link road across Hermitage Stream	Decanalising of channel will create a more natural appearance.	<i>Moderate Beneficial</i>
Ecology	Construction effects – disturbance of local wildlife (breeding birds, reptiles, bats, badger and dormice) and the risk of pollution	Update of surveys prior to construction. Measures to avoid disturbance. This includes the use of temporary fencing to limit access to sensitive areas during construction. Specific measures detailed in CEMPs. This includes protection of trees and hedgerow, additional habitat creation and buffer planting.	<i>Range of effects: Minor Adverse - Neutral - Minor Beneficial</i>
Waste and Recycling	Waste Treatment Capacity – construction waste arisings	Adopting designing out waste principles, recycling measures such as on site segregation of materials and adoption of Site Waste Management Plans. It is possible to reduce the volumes of waste by at least 60% if good recycling practices are adopted.	<i>Minor Adverse</i>

* Significance terminology differs in these topic assessments; equivalent standard term in brackets.

- 19.3 Table 19.2 summarises the impacts associated with the completed development. As above, the residual significance assignment relates to the worst case referred to in the topic assessment and is, thus, a conservative representation of the predicted permanent impacts of the scheme.

Table 19.2 - Permanent Impacts and Assessment of Significance

Topic	Permanent Impacts	Treatments/Mitigation	Residual Assessment
Land Use	Agricultural land quality	No mitigation required: permanent land use change	<i>Minor Adverse</i>
	Local farm businesses	No mitigation required: tenancies will have been terminated	-
Socio-Economic Considerations	Employment creation - 3,506 gross direct jobs, equating to 1,272 net additional jobs at the local level and 1,893 at the regional level.	Partnership working between local training and skills providers and local businesses will enable more local people to acquire the skills and qualifications necessary to take advantage of the jobs created during the operational phase of the scheme.	<i>Major Beneficial</i>
	Additional annual GVA of £44.3 million at the local level and £72.5 million at the regional level.	N/A	<i>Major Beneficial</i>
	Security and crime prevention	Consideration of crime prevention at the design, layout and construction stages of the development.	<i>Minor Beneficial</i>
	Sustainable communities - provision of large numbers of jobs in proximity to major planned housing developments.	N/A	<i>Minor Beneficial</i>
	Contribution towards economic development and regeneration objectives as outlined in the Havant Core Strategy, Havant Employment Land Review, PUSH Economic Development Strategy, Regional Economic Strategy and PPS4	N/A	<i>Moderate Beneficial</i>

Topic	Permanent Impacts	Treatments/Mitigation	Residual Assessment
Transport & Accessibility	Traffic impact - an increase in journey time, traffic queues and driver delay by 2026	Proposals incorporate site access and link road	<i>Moderate Adverse</i>
	Public transport impact	Cross Borough Service	<i>Moderate Beneficial</i>
	Pedestrian and Cycling Impact	On-site pedestrian and cycle routes Retain existing pedestrian and cycle routes	<i>Neutral</i>
Air Quality	Local air quality affected by changes in traffic	Increasingly stringent exhaust emissions criteria at a national and European level.	<i>Neutral</i>
Noise and Vibration	Traffic Noise from Development	None (negligible change in traffic)	<i>Neutral</i>
	Traffic Noise on Development	Design of Hotel and Offices	<i>Neutral</i>
	Night Time Deliveries	Distance and number of deliveries per night	<i>Minor Adverse</i>
	Car Park	None	<i>Neutral</i>
	Industrial and Plant Noise	Design, Layout, Noise Conditions Imposed	<i>Minor Adverse</i>
Cultural Heritage	Sir George Staunton Conservation Area	The scheme would not affect the visual setting of the conservation area	<i>*No residual effects (Neutral)</i>
Ground Conditions and Contaminated Land	Small pockets of contaminated land may be present within the development area.	Will be treated/ removed during the construction period.	<i>Neutral</i>
Water Resources and Flood Risk	Water environment - pollution from run-off, increased impermeable areas,	Sustainable drainage system; a drainage site management plan; water efficiency measures; further consultation and provision of more detailed information should be provided to the sewerage provider at detailed planning application stage	<i>Minor Adverse</i>
	Hermitage Stream Restoration – benefits to fluvial flood risk, aquatic geology and geomorphology	Restoration of approximately 100m of Hermitage Stream provides improved and increased extent of aquatic ecology habitat.	<i>Minor Beneficial</i>
Landscape and Visual Assessment	Site traffic and activity associated with Link Road	Integration of site circulation within site wide landscape structure.	<i>Minor Adverse</i>

Topic	Permanent Impacts	Treatments/Mitigation	Residual Assessment
	Activity associated with built form, most notably distribution uses	Mitigating screen planting to southerly boundaries of site will reduce impact combined with co-location of building to screen car park areas beyond.	<i>Minor Adverse</i>
Ecology	Operational effects predominantly beneficial due to the establishment of the new woodland planting and the habitat creation areas. The only exception is slight adverse effects on bats.	A five-year post-construction monitoring plan will be drawn up by a suitably qualified ecologist and incorporated into the CEMPs. Implementation of the management plan for Beech Wood East SINC. Minimisation of light pollution. Strengthening of commuting corridors (hedgerows) and enhancement of woodland edges.	<i>Mainly Minor Beneficial or Neutral. Minor Adverse on bats.</i>
Waste and Recycling	Waste Treatment Capacity	Adopting recycling, providing appropriate provision for recyclables on site, staff education programmes. It is possible to reduce the volumes of waste by at least 50% if good recycling practices are adopted.	<i>Minor Adverse</i>

* Significance terminology differs in these topic assessments; equivalent standard term in brackets.

- 19.4 The Proposed Development responds to the need for increased employment in Havant and presents a sustainable way of accommodating a large part of Havant's development requirements.
- 19.5 This Environmental Statement has examined the significant environmental effects of the Proposed Development and has found that, whilst some adverse environmental effects are unavoidable, it is remarkable that, for a large scale development, the adverse effects are generally minor with many residual benefits being identified including a major beneficial socio-economic effect. Such adverse effects have been minimised, as far as is practicable, through sensitive and sustainable design and the adoption of best practice in the management and control of construction. These findings thus corroborate the initial work done by the Borough Council in identifying Dunsbury Hill as an area having the environmental capacity for major new development.

