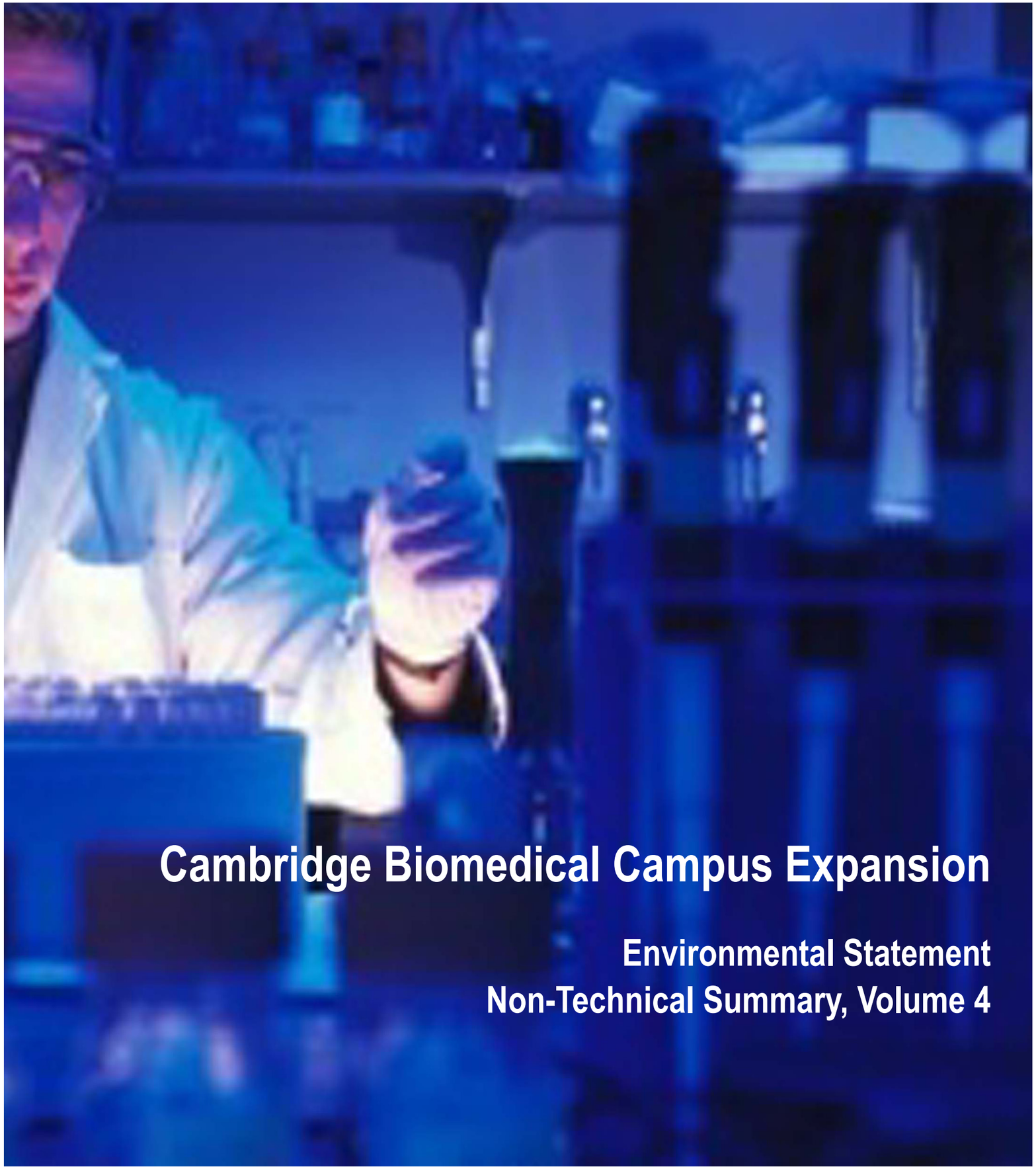

Cambridge Biomedical Campus Expansion

Environmental Statement
Non-Technical Summary, Volume 4

ENVIRON

The Pemberton Trustees

Countryside Properties

LIBERTY PROPERTY TRUST

Cambridge University Hospitals NHS
NHS Foundation Trust

CONTENTS

Abbreviations and Terms Used

ADF	Area Development Framework
AOD	Above Ordnance Datum, based upon mean sea level at Newlyn in Cornwall. For practical purposes, a level above Ordnance Datum can be considered to be the height above mean sea level.
AQMA	Air Quality Management Area
CCC	Cambridge City Council
CCoC	Cambridgeshire County Council
CEMP	Construction Environmental Management Plan
CGB	Cambridge Guided Bus
CHP	Combined Heat and Power Plant
EIA	Environmental Impact Assessment
ES	Environmental Statement
GEA	Gross External Area – a measure of floor space
GP	General Practitioner - Doctor
ha	Hectare, a unit of area measurement = 10,000 m^2
m^2	Square metres, a unit of area measurement.
MRC	Medical Research Centre
NO_2	Nitrogen dioxide
NTS	Non -Technical Summary of an ES.
OPA	Outline Planning Application
SI	Statutory Instrument - a UK government document that establishes regulations.
SPG	Supplementary Planning Guidance
SSSI	Site of Special Scientific Interest
SUDS	Sustainable Urban Drainage System
TA	Transport Assessment

1.0 INTRODUCTION

1.1 BACKGROUND TO THE ENVIRONMENTAL STATEMENT

This Environmental Statement (ES) relates to an outline planning application submitted on behalf of Countryside Properties Plc, Liberty Property Trust, Cambridge University Hospital's NHS Trust and the Pemberton Trustees for the expansion of the Cambridge Biomedical Campus (CBC); an expansion of the campus's clinical services, teaching and research activities is proposed. The site location is illustrated in Figure 1.

The Environmental Impact Assessment (EIA) of the scheme assesses the likely significant environmental effects of the proposed development during the construction and operation of the development, and proposes mitigation measures where required.

The EIA has been undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (SI 1999/293) (The EIA Regulations), which implement EC Directive No. 85/337/EC on environmental impact assessment, as amended by EC Directive 97/11/EC.

Reference has also been made to the following policy and good practice guidance in EIA:

1. Preparation of Environmental Statements for Planning Projects that require Environmental Assessment – A Good Practice Guide, DOE 1995;

2. European Union- Guidance on EIA; EIS Review, Environmental Resources Management, 2001;

3. Department Environment, Transport and the Regions (DETR) Circular 02/99 - Environmental Impact Assessment

4. Impact Assessment Guidelines and ES Review Criteria from the Institute of Environmental Management and Assessment (IEMA); and

5. Office of the Deputy Prime Minister (ODPM), Note on Environmental Impact Assessment Directive for Local Planning Authorities 1999 EIA Regulations, July 2002.

1.2 STRUCTURE OF THE ENVIRONMENTAL STATEMENT

This NTS is the fourth volume of the ES. The first volume contains the main text of the ES, along with technical appendices. It includes a description of the development and of the existing conditions on site and in surrounding areas. It also discusses the potential environmental impacts of the proposal and the means by which these would be mitigated.

The Landscape and Visual Assessment by David Jarvis Associates and the Transport Assessment by Faber Maunsell form Volume 2 and Volume 3 of the ES respectively.

1.3 THE PROJECT TEAM

This ES has been produced by ENVIRON UK Limited with information drawn from a number of sources. Consultants included Countryside Properties Ltd (Project Management), Liberty Property Trust, Cambridge University Hospital's NHS Trust, Aukett Fitzroy Robinson (Architects), Faber Maunsell (Geotechnical, Drainage, Infrastructure and Transportation Consultants), Ecosulis Ltd (Ecological Consultants), David Jarvis Associates (Landscape Consultants), Building Research Establishment Ltd (sunlight, daylight and wind consultants), Cambridge Archaeological Unit (Archaeological Consultants) and Bidwells for planning advice.

FIGURE 1: SITE PLAN SHOWING APPLICATION BOUNDARY

2.0 THE SITE AND THE PROPOSED DEVELOPMENT

2.1 THE SITE

The site of the proposed development ("the site") is situated in the southern outskirts of the City of Cambridge (CC), immediately west of the existing Addenbrooke's Hospital. It covers a total area of 28.87 hectares (ha) and is approximately 700m long by 400m wide.

The existing land use of the site is arable agriculture. A footpath and cycle connection from Addenbrooke's Hospital to Trumpington, runs east-west through the centre of the site. A surface water drainage ditch runs adjacent to the footpath and collects surface water from the existing CBC.

The western boundary of the site is defined by the main London-Cambridge Rail line with open agricultural land beyond and the eastern perimeter of Trumpington. The application site boundary extends over the railway line to allow for inclusion of an electricity substation. Agricultural land borders Hobson's Brook on the western side of the rail line, and forms part of Cambridge's retained Green Belt in the form of a Green Corridor. The Brook is an important ecological feature and wildlife corridor.

The northern boundary is defined by the edge of the Long Road Sixth Form College, whose playing fields separate the site boundary from the school buildings.

The eastern boundary is defined by the existing CBC and the new Elective Care facility and Cancer Research Centre UK buildings in particular, which are currently under construction. Existing buildings at the CBC mostly vary in height between 1 and 5 storeys. The tall incinerator chimney is a prominent focal point. Robinson Way, a road serving the existing campus, runs down the eastern boundary of the site.

The southern boundary is defined by an open ditch that drains westwards towards Hobson's Brook to the west of the railway line. There is little vegetation on this boundary and there are open views to the south as a result. The Nine Wells Local Nature Reserve is approximately 200m south of the site boundary. A strip of agricultural land to the immediate south is safeguarded by the policies of the Cambridge Local Plan 2006 until after 2016 for future clinical development and research uses.

2.2 REASONS FOR REDEVELOPMENT AND ALTERNATIVES CONSIDERED

The location of the proposed development has been chosen for its proximity to the existing CBC. It creates an opportunity for co-location of activities on the campus, which would assist clinicians and researchers to work together in the integrated development of diagnosis and treatments for patients, strengthening the international reputation of the Campus. It is also an opportunity to expand clinical care to deal with additional demand for hospital services created by population growth and changing medical practices. Due to these considerations, only alternative sites adjacent to the Campus were considered for the development location. Land to the north and east of the Campus is already developed and is in education and residential use. Land to the south of the Campus provides potential for growth and has been safeguarded until after 2016 for future clinical development and research uses. Consideration of the uses for the site was informed by the Cambridge Southern Fringe Area Development Framework, which sets out a number of key development principles for the site.

The site layout was chosen as it provides the best opportunity to link the existing hospital and the proposed development allows for permeability to the green corridor, allows optimum flexibility for development of the site and minimises the need for vehicular infrastructure and associated hard surfaces.

The proposed development also requires an electricity substation, which will be located within the Green Belt. The applicants have considered alternative locations for the substation; it is felt that the current position adjacent to the CGB embankment will provide the least visual intrusion of those options considered.

2.3 THE DEVELOPMENT

A parameter plan which details the maximum areas for each land use within the development area is shown in Figure 2.

Within the proposed development of 28.8 ha, a gross target development area of 215,000m^2 has been proposed. This would include the following areas, pursuant to Policy 9/5 of the Cambridge Local Plan 2006:

- A 'Clinical' area of 7.80 ha for NHS and private clinical development;

- A 'Research' area of 10.56 ha of employment land for commercial development, comprising biomedical and biotechnology research and development activities within Use Class B1 (b), related support activities, related higher education and sui-generis medical research institutes;

- A 'Clinical/Research' area of 5.2 ha comprising employment land for commercial development or further NHS and private clinical development. This area includes 2.2 ha reserved for the possible relocation of Papworth Hospital. In the event of it not being needed for this use, it would be available for other clinical, higher education, or sui-generis medical research institute uses.

General off-plot infrastructure such as roads and structural landscaping would occupy around 16% of the gross site area.

The existing hospital buildings and those presently under construction vary in height, but are mostly 3-5 storeys. The highest building on the site is 16 storeys in height. Buildings within the new development are expected to be similar in height. Building heights will be no higher than 36m above ground level including roof level plant, but excluding building flues. For the maximum heights scenario, building heights will be scaled across the site, with generally lower buildings located towards the western and south western boundaries and higher buildings located towards the existing campus. This would allow for a perceived gradation in scale towards the existing campus when viewed from the west or south and helps to assimilate the existing hospital buildings into the landscape. Buildings are unlikely to achieve the maximum massing set out in the parameter plan, and are more likely to have permeable broken frontages that allow for views through and between buildings.

The aims of the design are to:

- Develop world leading clinical research and treatment facilities that stimulate and support patient treatment and recovery;

- Offer a unique and high quality destination for businesses with the emphasis on research and development;

- Present a range of building sizes and configurations, ensuring maximum flexibility for occupiers and the potential to attract significant inward investors;

- Create a high quality setting for the new development that is compatible with its surroundings;

- Deliver a development that follows the principles of sustainable development within commercial parameters;

- Produce a high quality landscape within which the proposed new buildings are to be set, with a high degree of accessibility and an integrated solution for storm water runoff; and

- Offer on-site management, retail and café ancillary facilities as amenities for the use and employment of occupiers and their visitors.

2.4 CONSTRUCTION

Construction works are expected to last about ten years.

Phasing of the research buildings will follow market demand, but the general aim will be to locate new development adjacent to previous phases. The site is not easily accessible from existing infrastructure, therefore the first phases of the development would need to commence to the north of the site, close to the existing access point at Long Road/Robinson Way. Once access is available from the proposed Addenbrooke's Access Road to the south, development will be able to commence in the southern area of the site. It is likely that the north-south running boulevard and associated infrastructure will be constructed first to service initial phases of development.

A Construction Environmental Management Plan (CEMP) will be devised and agreed with the relevant authorities. Trade contractors will be required to demonstrate how they will work within these provisions, identify communication channels for exchange of information, and set out programmes for monitoring and auditing of environmental control systems. Where departures from the programme are inevitable, prior identification is required, such that other mitigation measures can be employed. The CEMP will address, *inter alia* control of noise and dust, hours of working, control of run-off, vehicle routing, road / footpath closures or diversions and waste disposal. The CEMP will provide a necessary level of management and control of demolition and construction practices. This includes advance notice of operations and duration of work that may cause disruption to access, noise or other effects.

It is concluded that with the intended measures in place and from adherence to the CEMP devised for the site, the development may be constructed without significant adverse effects on the immediate and wider environment.

2.5 A SUSTAINABLE DEVELOPMENT

Ensuring the delivery of sustainability initiatives and aspirations are key to achieving a sustainable development. To ensure that the sustainable performance of the proposed development, as assessed in the appraisal, is carried forward into the detailed design stage a number of sustainability commitments have been identified and agreed to by Countryside Properties PLC; Liberty Property Trust UK, Cambridge University Hospital's NHS Foundation Trust and the Pemberton Trustees.

Overall, the proposed development is considered to contribute to the sustainability objectives in most areas used to review the development; those set out by the Cambridge's Sustainable Design Guidelines Checklist. The exception to this is the proposal's impact on biodiversity and open space. However, this site has been designated for the expansion of Addenbrooke's Hospital by the Local Plan Policy. Mitigation planting and habitat creation on site will assist in lessening the impact. A well-designed public realm area has also been included in the proposed development.

The proposed development will be designed to conserve natural resources and address energy conservation measures. There are recognised systems for evaluating, in broad terms, the environmental performance of buildings. One of these, the Building Research Establishment Environmental Assessment Methodology (BREEAM) rating system, has been widely adopted in the UK. The design will aim to achieve a BREEAM rating of 'Very Good'.

The achievement of the goals is based on consideration of impacts on the existing local environment (e.g. ecology), global environment and resource use (energy, materials use and water use), transport, and health and well-being – a factor in the choice of construction materials in relation to long-term performance.

Furthermore, recycled materials will be used where appropriate. Concrete, stone, steel and glass are the principal materials commonly used in construction and can potentially be re-used and recycled at the end of the life of the building.

The Construction Industry Research and Information Association (CIRIA) has produced several documents which provide guidance for the construction industry on waste minimisation and the use of recycling and recycled materials within demolition and construction projects. These will be followed where appropriate.

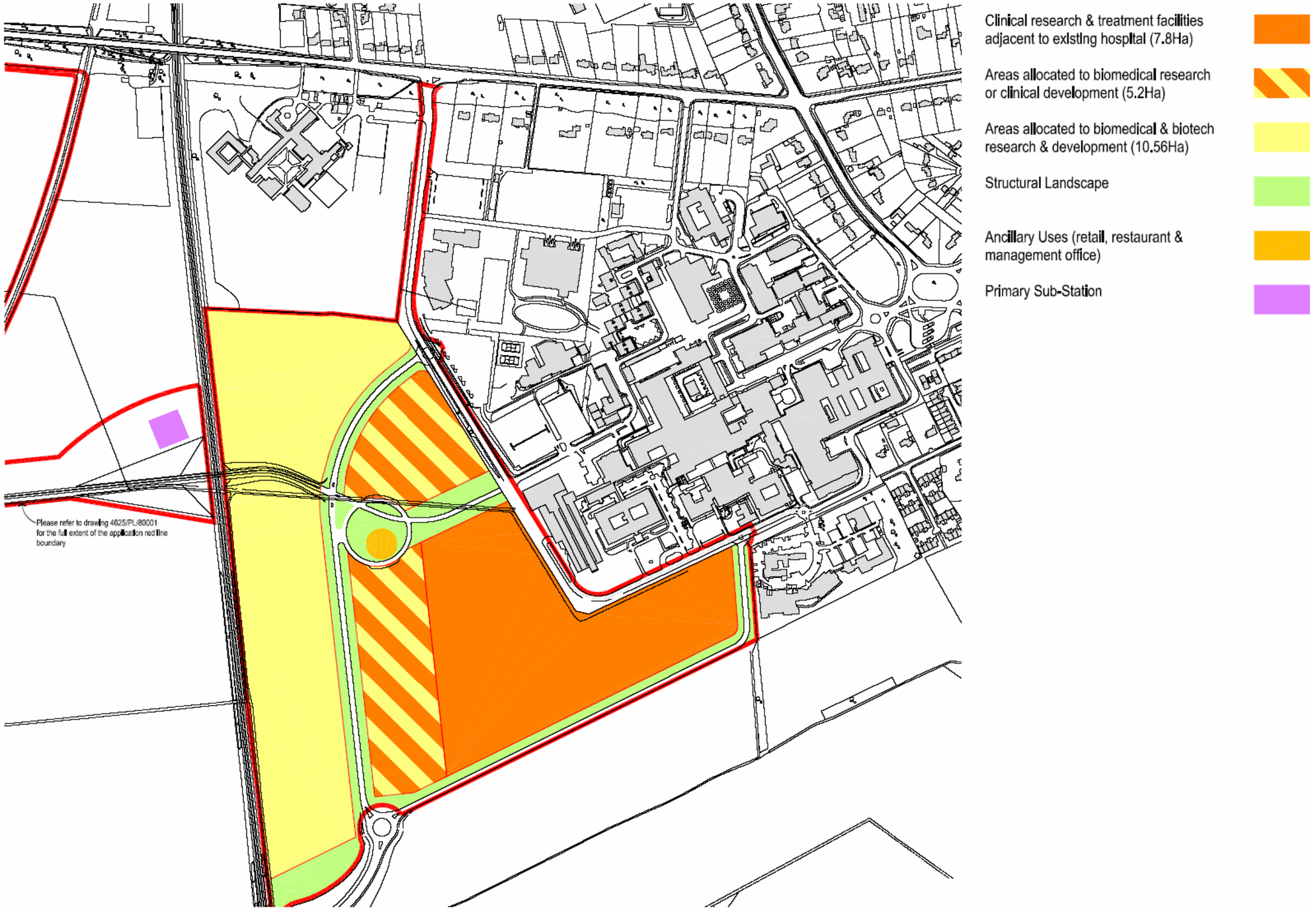

FIGURE 2: LOCATION OF LAND USES

3.0 TRANSPORT

The transport impact assessment has been undertaken to assess the impact of the expansion of the Cambridge Biomedical Campus on the local transport network in order to develop appropriate infrastructure to cater for the additional travel demand generated by the development.

The assessment also includes consideration of the implications of the Hospital's Learning, Seminar, Hotel and Conference Centre, Clay Farm and Glebe Farm and the intensification of the use of existing buildings on the Addenbrooke's campus on the local highway network. In addition it also includes consideration of the highway access requirements of these developments. The proposed Addenbrooke's Access Road will provide access to the developments and will partly mitigate the impact of the development generated traffic.

The CBC and the Learning, Seminar, Hotel and Conference Centre will access the highway network via the existing Addenbrooke's access junctions and also by a new junction at the eastern end of the Addenbrooke's Access Road. The transport assessment demonstrates that these junctions will operate satisfactorily following the introduction of the developments. However, the Hills Road access will need some improvement.

Walking and cycling strategies have been developed for the CBC. These provide a comprehensive network to provide high quality facilities for staff, patients and visitors visiting the expansion of the Cambridge Biomedical Campus, the Addenbrooke's Forum and the existing Addenbrooke's campus. This will include:

- A central pedestrianised area along the central corridor of the campus;
- Cycleway links to a proposed route on the eastern side of the railway to link to the Addenbrooke's Access Road and the main internal roads within the CBC;
- Cycleway link between the route proposed above and Red Cross Lane along the southern edge of Robinson Way;
- A new paved footway along the route of Footpath 47 around the outside of the existing Addenbrooke's boundary; and
- A section of footway cycleway on the strategic route between Addenbrooke's and Trumpington, between the CGB and Foster Road. This would be promoted jointly with Clay Farm.

The proposed transport network has been developed with the requirements of the Disability Discrimination Act in mind. This means that the needs of people with mobility impairment would be satisfactorily accommodated with the proposals promoted by the development.

The CBC will provide high quality bus stops within the development. One CGB stop would be provided in the Circus area of the development. Two new stops would be provided for conventional bus stops on the internal roads within the development. These are positioned so that the majority of the development is within a 5 minute walking journey of a bus stop. The existing stop adjacent to Rosie Hospital will be re-located as it is currently positioned on a section of Robinson Way which will be bypassed by the CBC internal road network.

The CBC and R&D parking strategy adopts a 1:72m^2 parking ratio, which is commensurate with the existing regime on the Addenbrooke's campus. However, initially it proposed that R&D element of the development could have a ratio of 1:50m^2. This aims to allow businesses locating from elsewhere to have a period of time to adjust to the strict parking regime in operation on the campus.

Parking for the clinical element of the development would be provided in multi storey car parks. Parking would be provided for people with disabilities at a rate which complies with Cambridge City Council's standards.

Cycle parking would be provided throughout the development at the ratio of 1 staff space per 120m^2 and 1 visitor space per 600m^2, which complies with Cambridge City Council's standards.

Appropriate infrastructure is promoted to encourage journeys by public transport, walking and cycling. Travel Plans to encourage the take up of these modes are also proposed. It is therefore concluded that the impact on the highway network can be satisfactorily mitigated and appropriate infrastructure is promoted to cater for the travel demands for the expansion of the Cambridge Biomedical Campus.

4.0 SUMMARY OF ENVIRONMENTAL EFFECTS

4.1 LAND USE AND POLICY

Work carried on at the existing Cambridge Biomedical Campus has achieved both national and international recognition. In the field of healthcare and related research, it is a pre-eminent centre in the United Kingdom. Approved and emerging planning policy documents seek to create a policy climate allowing those uses to expand and flourish. In doing so, proposals are being brought forward to achieve urban design excellence, to help bring necessary improvement to the existing CBC built form and to seize the opportunity to create a pleasing and striking new urban edge in this part of Cambridge. The master plan and design statement demonstrate that those expectations can be met. At the more detailed level established by the Southern Fringe Area Development Framework, these proposals will deliver the principles set down.

The illustrative masterplans, Design and Access Statement, landscape analysis and related proposals demonstrate that this part of the southern urban extension can be achieved in a manner which respects the siting on the southern edge of Cambridge. Implementation of the urban design and landscape elements will create a pleasing new urban edge.

The accompanying planning application will allow the existing campus to expand and continue to achieve high standards of research and practice, in a manner which will make an important contribution to Cambridge.

4.2 LANDSCAPE AND VISUAL IMPACT

The Landscape and Visual Impact Assessment concerns predicted landscape and visual effects of the proposed expansion to Cambridge Biomedical Campus at Addenbrooke's Hospital, Cambridge.

The site lies within the Countryside Agency National Character Area - East Anglian Chalk,which borders the Bedfordshire and Cambridgeshire Claylands Character Area. At a city level the site is defined in the Cambridge Landscape Character Assessment as being part of the Rural Lowland Mosaic within the Southern Fringe Cambridge Character Area.

The site is generally flat and featureless agricultural land. It lies between the built edge of the city and the rural chalkland landscape which begins to rise to the south east. Sensitive landscape receptors identified include local Public Rights Of Way, the Rural Lowland Mosaic and Hobson's Brook River Corridor character areas. The site and near adjoining landscape are considered to have Medium-High landscape value overall. Two categories of visual receptors have been identified: users of public rights of way and users of roads.

Proposed mitigation relates to the introduction of planting along the western boundary, around the substation, building heights and lighting. Analysis of predicted effects on landscape character indicates that there would be no significant effects on landscape features but that there would be moderate-slight adverse impacts on local rural landscape characteristics. Effects on landscape character are assessed as being of moderate/moderate high significance in relation to loss of amenity value and scenic interest.

Analysis of the predicted visual impacts generated by both options indicate that the Zone of Visual Significance extends to approximately 3km from the site. Within the ZVS the visibility is generally good and largely unobstructed from the West and South. Of the thirty three viewpoints assessed, ten were found to have no view of the site. Of the remaining twenty three, only twelve viewpoints experience impacts of Moderate-Substantial significance or above. All these viewpoints, with the exception of View Point 10 and 12 are within 1km of the site, most are immediately adjacent. Beyond the 1km mark intervening development, landform and vegetation begin to screen and filter both options. Due to the overall height of both options there is little difference in the predicted impacts.

Mitigation planting, whilst not providing any total screening of either option, plays an important role in filtering and softening ground level views and in screening smaller elements such as the substation and Addenbrooke's Access Road embankments.

Visual impacts for the expansion of the Cambridge Biomedical Campus as part of the wider Southern Fringe Area Development Framework are further reduced due to the screening effects of intervening development on other sites.

It is concluded that proposed development is not materially in conflict with landscape related planning policy. In summary the proposed expansion of the Cambridge Biomedical Campus offers the opportunity to create a unified well defined, high quality edge to the City with limited landscape and visual impacts.

4.3 ARCHAEOLOGY AND BUILT HERITAGE

The assessment has considered the potential impact on the archaeology and cultural heritage of the proposed development. In conducting the assessment, previous desktop studies, aerial photographic and geophysical surveys and previous fieldwork have been considered, including the known archaeological and cultural heritage resource.

Previous chance finds from earlier archaeological investigations and more recent aerial and geophysical surveys, evaluations and open area excavations have revealed an area of rich archaeological potential, notably dating from the later Iron Age to Medieval periods within the proposed development and the wider landscape.

This richness thus provides an example of human activity in Cambridge's southern hinterland that challenges previous assumptions about settlement organisation and distribution, land tenure and continuity of use, especially in terms of pre-Iron Age prehistoric activity and early Saxon occupation.

Although a limited area of the known archaeology has been previously disturbed by post-war development, a significant proportion of this resource remains largely undisturbed. The development of the site may lead to the loss of a significant proportion of the known archaeology present within the site area.

If the appropriate mitigation and sampling strategies are adopted and implemented, the impact of the proposed development on the archaeological resource will be minimised. All proposed mitigation will be conducted in accordance with a Written Scheme of Investigation drawn up in consultation with the County Council Development Control Archaeology Office.

4.4 AIR QUALITY

A review of monitoring data from the air quality monitoring stations most representative of air quality at the proposed development site indicates that air quality at the site will be expected to meet all of the objectives set by the Air Quality (England) Regulations 2000 and 2002 amendment.

Modelling carried out as part of the Cambridge City Council (CCC) Review and Assessment procedure predicted exceedances of the annual mean 2005 nitrogen dioxide objective within the centre of Cambridge City, however as pollutant concentrations within the CCC study area (including Trumpington and areas to the east of the Addenbrooke's Hospital) were previously predicted to meet all the air quality objectives, no modelling was carried out within the vicinity of the development.

As a result of the predicted exceedance of the annual mean nitrogen dioxide objective CCC have declared an Air Quality Management Area (AQMA) covering much of the city centre and has developed an air quality action plan to further reduce pollutant concentrations. As road traffic is the major source of pollutant emissions in the area, the plans will promote sustainable transport methods and seek to reduce vehicle numbers. The boundary of the AQMA is located approximately 1.8km north of the proposed development therefore, although pollution levels are predicted to meet the air quality objectives within the study area, actions developed through the air quality action plan may impact on this part of the city.

During construction activities, there is the potential that emissions of dust arising from the site will result in nuisance soiling at nearby properties. Typically impacts are restricted to within 100m of the site boundary. The risk of impacts is greatest at buildings located within Addenbrooke's Hospital, within 100m of the proposed development.

In all urban environments considerable care should be taken to control and minimise dust emissions from construction activities. Dust emissions can be effectively controlled by the employment of stringent management practices e.g. the use of 'just in time' deliveries to preclude the need for large stockpiles, use of water sprays, screens and maximising separation distances. These will be implemented through adherence to a Construction Method Statement agreed with CCC and through following the Considerate Contractors Scheme, set up by the Council.

The proposed Addenbrooke's Access Road is predicted to have an overall positive impact on air quality within the southern fringe area, although concentrations are predicted to increase slightly at locations adjacent to the new road.. The proposed development will not result in a significant number of additional vehicles using the local road network. Comparison of the predicted pollution concentrations for the future scenarios with and without the proposed development indicates that there will be minimal changes in pollutant concentrations as a result of the development. Similarly, both the proposed development and other proposed developments within the study are predicted to have little impact on local air quality.

Operational traffic associated with the proposed development and other proposed developments will not result in the designation of a new AQMA or the extension of the existing AQMA. Changes in

concentrations at the majority of locations within the study area will not be noticeable over the natural year on year variation in pollution concentrations. Pollution concentrations at locations adjacent to the proposed access road, which are predicted to increase, will remain considerably below the air quality objective. Impacts arising from the proposed development are of low priority and are therefore not considered as significant.

Overall, the predictions of pollutant concentrations for the future years show an improvement in air quality over the existing situation in 2004 in all locations. This is as a result of the improvements in vehicle and fuel technology, leading to a decrease in emissions, outweighing potential increases in emissions from new traffic generated by the development.

4.5 NOISE

This assessment is based upon a combination of existing baseline noise monitoring, baseline noise prediction and future noise prediction.

Predictions have been carried out to determine noise levels at the nearest existing sensitive receptors during site preparation and construction works, in accordance with British Standards.

The target noise criterion level for residential dwellings is predicted to be met at all receptor locations during all phases of work, with predicted levels being well below the criterion level as a result of significant separation distances from the proposed work. The target noise criterion level for more sensitive receptors, such as hospitals, colleges and schools is predicted to be met at the majority of locations during all phases of work.

The only exception is the Elective Care Centre hospital building, which is predicted to experience exceedance of the criterion level for the worst case (with works close to the site boundary) of all construction phases. Mitigation measures have been proposed that, will be capable of achieving the target noise and vibration criteria for all assessment positions and therefore, no residual impacts have been identified.

Predicted changes in noise emission due to road traffic have been assessed for the construction and operational phases of the development. The opening of the proposed Addenbrooke's Access Road, which is intrinsically linked to the proposed development is predicted to result in significant noise impacts, in particular at receptors close to the access road's junction with Shelford Road. However, as the proposed access road has been subject to a separate ES, which included a detailed assessment of impacts and recommended mitigation measures, no detailed consideration of impacts associated with this scheme is presents in this ES.

In respect of traffic noise impacts during construction of the proposed development, no perceptible increase in noise is predicted and as such, it is considered to be of no significance.

In respect of traffic noise impacts from operation of the proposed development, no significant impacts are predicted as a result of the development alone. Given the gradual increase in traffic that is likely as the development becomes operational, the change in level would be, at most, barely perceptible and of minor significance. Therefore, it is considered that no specific mitigation measures are required to control road traffic noise once the proposed development is operational.

In respect of cumulative traffic noise impacts resulting from cumulative traffic associated with the proposed development and other proposed development in the area such as the Clay Farm and Glebe Farm residential developments, the Addenbrooke's learning, seminar, hotel and conference centre and secondary school development, significant impacts are predicted at five sensitive receptor locations. The predicted increases in noise associated with these significant impacts are likely to be readily perceptible and of moderate significance. Mitigation measures have been recommended to control the cumulative effects which would be capable of reducing the predicted increases in noise to acceptable levels.

A vibration survey and assessment has been carried out in order to evaluate vibration levels from the railway line running along the western boundary, that have potential to effect the closest proposed buildings (15m from the railway) on the development site,

The vibration assessment shows that the level of vibration from the railway is unlikely to affect the structure of the proposed building nor affect the occupiers of the buildings. If the building(s) is to be used for general office or general laboratory purposes, mitigation measures would not be necessary. However, the buildings (within 15m of the railway) are to be used as precision laboratories than heavy concrete structures may be necessary to be within the relevant criteria.

Limiting noise levels have been set for any building services plant. Provided that the rating noise levels from the building services plant do not exceed the stated noise criteria, whether through the application of noise control techniques or otherwise, the impact of noise from such sources is predicted to be of no significance.

4.6 WATER RESOURCES

The site is located approximately 450m west of Hobson's Brook, which flows in a northerly direction. It does not lie within a groundwater Source Protection Zone for public water supply.

The site is underlain by two major aquifers (located with the Grey Chalk subgroup and the deeper Woburn Sands) according to the Environment Agency. Perched water was also observed within the Cohesive Drift Layer.

Groundwater monitoring undertaken indicates that there is no evidence of existing significant contamination of the groundwater. Results of surface water quality testing for Hobson's Brook indicate that the site in its present state is not contributing to a decrease in water quality. Lower water quality was observed at the convergence point of Hobson's Brook and a small tributary which was concluded to be attributable to runoff from the nearby residential area and low/stagnant flow.

A Flood Risk Assessment has been undertaken for the development and concluded that the risk of flooding both within and surrounding the site is very low.

The main likely significant effects of the proposed development relate to:

- The potential impact of construction activities on groundwater and surface water;
- Movement of contaminated material to groundwater or Hobson's Brook and surrounding waterways; and
- Changes in the amount of storm water run-off generated by the proposed development.

During construction, the application of normal site drainage controls and protective systems will ensure that contamination of ground and surface water will be prevented. These measures will include use of sediment traps, which will be incorporated within the construction site drainage system. These will be used in tandem with protective measures to be employed during construction to prevent spillage of construction materials, soil or chemicals to groundwater and sewer. These measures will be based on Environment Agency Pollution Prevention Guidance documents and will be implemented during the construction period as part of the Construction Environmental Management Plan.

Following completion of the development, protective measures will be put in place to ensure that there is no net increase in storm water discharge from the site. This will include the provision of Sustainable Urban Drainage Systems to attenuate flow. In order to protect surface water quality, measures will be taken to ensure that drainage from roads and car parking areas within the site have adequate treatment prior to disposal from the site to drainage systems.

4.7 SOIL ENVIRONMENT AND LAND CONTAMINATION

Based on a review of historical land use information, a site walkover, a programme of site investigation works and analysis of soil and groundwater samples, and monitoring of ground gas conditions, and taking account of national policy on land contamination, no areas of significant contamination of soils or groundwater have been identified on the site. No requirements for remedial works to deal with contamination are anticipated.

The impacts of the construction and operation of the development principally relate to:

- potential construction impacts on the local environment from any localised areas of soil contamination which may be encountered in the course of construction works; and
- potential impacts on site users and construction workers from the soil environment, should any contamination be present.

A Construction Management Plan will be implemented during construction to mitigate and control any potential soil contamination caused by the proposed development. Although no remediation requirements are anticipated, proven means of clean up will be implemented if and where required.

Overall, the proposed development is unlikely to have significant effects on the soil environment as a result of its construction or operation. If contamination is discovered during the construction phase, measures will be put in place to ensure it is appropriately managed.

4.8 ECOLOGY

The site forms part of the wider farmed landscape south of Cambridge. The site is predominantly arable and intensively managed. Whilst this type of land management rarely promotes species diversity, the site has value to Badger, bats, Brown Hare, species of breeding birds and it is of significant importance, in combination with the wider arable landscape, to wintering birds.

Elements of naturalness, fragility and permanence on site are associated with the woodland, neutral grassland, mature hedgerows and associated features, and watercourses. The habitats on site are similar to those off site to the south and west and in the wider countryside of Cambridgeshire, and in this respect fragility is low.

The site supports permanent and transient presence of species of breeding and wintering birds, badgers, reptiles and bats. Habitat for these species would be lost in the development, however the development proposals provide for some habitat replacement and enhancement which would offset these impacts.

The ecological significance of the site is related to:

- the permanent and temporary presence of breeding and wintering birds on site;
- the presence of bats, reptiles, badger, and brown hare;
- the presence of a matrix of habitats including arable fields, hedgerows and associated features and watercourses, which offer foraging and habitat for a range of wildlife;
- the connective value of the site, particularly Trumpington Dismantled Railway, which offers linear habitats across the site and into the wider ecological unit; and
- The presence of neighbouring habitats of similar status and the species that use them

The site forms an extension of rural surroundings to the south rather than the urban landscape to the north and is fairly typical within this context due to its rural character.

The proposed development would alter the character of the site from one that is predominantly a farmed landscape to a built environment. This has implications for ecological resources.

The evolution of the Masterplans have been designed to provide benefits for biodiversity and retain important existing features. Key mitigation includes the provision of buffers alongside the north and west boundaries, amenity planting across the site and the use of Sustainable Urban Drainage Systems within the development, which would have dual function by maintaining the hydrological status of the area and providing habitat for wildlife.

Negative impacts on species are predicted, particularly for open countryside species, namely farmland birds and Brown Hare. The overall impact is negative and significant at a County level for approximately 63% of winter/passage birds recorded, including three Red-listed and four Amber-listed species.
Breeding birds including six Red-listed species and four Amber-listed species would also be affected at a District level. Other species would be affected in the short-term by construction phase impacts, particularly the more sensitive bird species using the site and adjacent areas, but these are likely to benefit in the longer-term due to the proposals.

Farmland birds, which are in decline nationally, would be permanently affected by the development and this impact is not reversible.

The residual impacts of the development on receptors can be summarised as follows:

- Significant negative impacts on three receptors; breeding birds, wintering/passage birds and Brown Hare. These species are associated with farmland and include large numbers of waders. Wading birds are listed as a group requiring protection in the Local Biodiversity Action Plan (LBAP);
- No significant impact on six receptors; arable, Hobson's Brook, Woodland, Nine Wells Springs LNR, Badger and Water Vole; and
- Significant positive impact on three features; boundaries (important hedgerows are a UK Biodiversity Action Plan Priority Habitat), on site watercourses (UK and LBAP habitat), bats (European Protected Species).

This assessment, which takes into account the generally low quality and diversity of the existing site, demonstrates that there would be some new opportunities for protected species within the development. However, because many of the species on the site are associated with open farmland, which would be lost without mitigation or compensation, the overall predicted outcome of the development with regard to ecology is negative.

4.9 MICROCLIMATE

4.9.1 Wind

The overall wind conditions around the proposed development are likely to be acceptable for the intended purpose. Until the trees along the London-Cambridge railway line become mature, wind

amelioration measures will be considered around any exposed entrances along any north-west facing building facades adjacent to the railway to protect against prevailing winds.

4.9.2 Sunlight and Daylight Assessment

The potential loss of light to nearby buildings and open spaces following development of the Cambridge Biomedical Campus has been analysed. The results have been compared with the guidance in the Building Research Establishment (BRE) Report 'site layout planning for daylight and sunlight: a guide to good practice'.

According to the guidelines, there will be no significant loss of light to any windows of existing dwellings or existing staff residences, or to the proposed future staff residences. Any impact on non domestic buildings on the hospital site is also limited.

Loss of sunlight to the playing fields of Long Road Sixth Form College playing grounds will be within the BRE Guidelines.

4.10 RESIDENTIAL AMENITY

The site already has a degree of light pollution, due to the adjacent Addenbrooke's Hospital. The proposed development will lead to some additional light at night. However, this additional light will have a minor impact on neighbouring residential properties buildings and measures will be provided to reduce the potential lighting impact. There were no other significant impacts on residential properties identified for other factors following mitigation.

4.11 SOCIO-ECONOMIC EFFECTS

The existing economic and social character of the city of Cambridge and its surrounds has been reviewed, in the context of the economy and social character at a local, regional and national level.

The proposed development is located within the Queen Edith's ward of Cambridge City, although it additionally borders Trumpington, Cherry Hinton and Coleridge wards. It is located in one of the strongest and fastest growing regions (the East of England) in the UK, which also has one of the highest rates of employment in the UK. Cambridge has experienced strong growth in economic performance, with employment levels expected to continue growth. Education is one of the major industries of employment in Cambridge and professions are the largest occupation group in the city. Hi-tech jobs also account for almost 20% of all employment within Cambridge. The existing CBC is a major employment hub within the Cambridge sub-region, currently employing over 9,200 people. It has a large student population, with a high percentage of economically inactive students compared to national data.

Within Queen Edith Ward, there is a bias towards working age people, with less young and people of pensionable age than the regional or national average. This is likely to be a reflection of the high student population of the city. The health of inhabitants is slightly better than the regional and national average, which reflects the age profile of the area of interest. Households are more likely to consist of multi person households, with lower rates of home ownership than in other parts of the country. The proportion of households with dependent children is also low relative to the national average. Crime rates in Queen Edith Ward are generally below the national average, with the exception of house burglary.

The proposed development will create employment during construction and on completion of the proposals. The level of construction employment is expected to create about 536 full-time equivalent jobs directly or indirectly. Once the development is completed, between 9,604 and 11,799 jobs are expected to be created directly or indirectly. Training and employment measures would be important in eliminating labour supply distortions and to allow for the creation of positions for local staff.

It is recognised that this level of anticipated employment will generate a need for housing within the southern fringe area of Cambridge. The Local Plan 2006 indicates that approximately 3320 dwellings are to be provided within the southern fringe and will include affordable and key worker housing. Clay Farm in particular will provide a significant element of affordable and key worker housing in close proximity to the proposed development.

The development of additional jobs on the CBC is entirely consistent with the agreed economic strategy for Cambridge and the sub-region.

4.12 CUMULATIVE IMPACTS

Cumulative impacts refers to the effects of the proposed development that may interact in an additive or subtractive manner with those of other developments that are not currently in existence or incomplete, but may be by the time the proposed development is implemented. Such developments have been taken into account in assessing the likely cumulative effects of the proposed development. The assessment concludes that there will be few significant environmental effects once mitigation measures are in place. There may be some negative cumulative effects on farmland birds recorded across the sites, which are present in medium-sized to large populations.