

**Norwich Research Park
Supplementary Planning Document**

**Sustainability Appraisal/Strategic
Environmental Assessment**

**SUSTAINABILITY APPRAISAL
REPORT**

**Prepared for
South Norfolk Council**

**by
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January 2007

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GLOSSARY OF ACRONYMS USED IN THE SA REPORT

DPD	Development Plan Document
FRI	Food Research Institute
JIC	John Innes Centre
LDD	Local Development Document
LDF	Local Development Framework
LDS	Local Development Scheme
LUC	Land Use Consultants
NRP	Norwich Research Park
NNUH	Norfolk and Norwich University Hospital
ODPM	Office of the Deputy Prime Minister
PPG	Planning Policy Guidance
PPS	Planning Policy Statement
RPG	Regional Planning Guidance
SA	Sustainability Appraisal
SEA	Strategic Environmental Assessment
SPD	Supplementary Planning Document
UEA	University of East Anglia

NON-TECHNICAL SUMMARY

INTRODUCTION

1. The South Norfolk Local Plan¹ allocates land to the west of Colney Lane, which is adjacent to existing research and academic institutions and the new Norfolk and Norwich University Hospital, for additional research and development uses as an extension to Norwich Research Park (NRP). 15 hectares of land at Colney Hall is also allocated for these uses. The Local Plan requires a Development Brief to be prepared for the extension to NRP, which will set the principles and parameters for development. The Development Brief will eventually be adopted as a Supplementary Planning Document (SPD).
2. The preparation of the NRP Development Brief SPD is being subject to a full Sustainability Appraisal (SA) in line with the Planning and Compulsory Purchase Act 2004 and current planning policy guidance (PPS12). The SA will also be in accordance with the requirements of European Directive 2001/42/EC (known as the Strategic Environment Assessment, or SEA Directive).
3. The difference between SA and SEA is that where SEA is more focussed on environmental impacts, SA includes wider ranging considerations, extending to the social and economic impacts as well as the environmental impacts. This joint SA/SEA was undertaken in line with the ODPM guidance on SA². Throughout the report, SA is used to mean 'sustainability appraisal incorporating the requirements of SEA'.
4. The purpose of SA is to promote sustainable development by helping to integrate social, environmental and economic considerations into the preparation of plans³. It should be viewed as an integral part of good plan-making, involving ongoing iterations to identify and report on significant effects of the plan and the extent to which sustainable development is likely to be achieved.

NRP DEVELOPMENT BRIEF SUPPLEMENTARY PLANNING DOCUMENT

5. Development Briefs provide a stepping stone between the provision of planning policy and the form and detail of a planning application. The NRP Development Brief has been prepared to guide and co-ordinate the form of development on land allocated as an extension to NRP. It will be used by the Council in its determination of detailed planning applications for the site.
6. The overall objectives of the NRP Development Brief SPD are:
 - To implementing allocations and land uses in the Local Plan;
 - To provide developer and landowner certainty over development at NRP;

¹ Adopted in 2003 and runs until mid 2006. South Norfolk Council is currently preparing their Local Development Framework which will eventually replace the South Norfolk Local Plan.

² *Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents*. Office of the Deputy Prime Minister, November 2005.

³ *Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents*. Office of the Deputy Prime Minister, November 2005.

- To enhance the efficiency of the planning process and the process of planning applications;
- To promote high-quality design and innovation; and
- To reflect physical constraints and opportunities in the area.

7. The Vision Statement for the NRP Development Brief SPD has been defined as:

The extension to NRP will underpin the international presence of Norwich as a centre of excellence in providing research and training particularly in biological, chemical and environmental sciences. In acting as a magnet to, and fully serving the diverse needs of, a wide range of indigenous companies and inward investment opportunities, NRP will significantly contribute to the economy of Norwich and the wider area.

NRP will be an exemplar for the sustainable development of research and development parks. It will embrace good design and contribute to the quality of life of local people, by improving provision of local services and facilities. It will make a major contribution to tackling climate change, one of the greatest challenges we are facing, by incorporating energy efficient design and techniques, offsetting carbon emissions and aspiring to carbon neutrality over the life-time of the development.

METHODOLOGY

8. The ODPM SA Guidance specifies a number of stages of work that have to be undertaken. The first three stages of the SA have been completed and are documented in this SA Report (i.e. Stages A, B and C). These involved the following:

Stage A: Setting the context and scope

9. The first stage of the SA/SEA culminated with a Scoping Report (June 2006). This report included a review of other plans, strategies and studies relevant to the preparation of the NRP Development Brief SPD, collecting baseline information to characterise South Norfolk and NRP, identifying of key sustainability issues for NRP, and identifying an appraisal framework.
10. The review of other plans, strategies and studies identified plans relevant to the NRP Development Brief SPD at the international, national, regional, county and district level. The review identified the key objectives associated with these plans.
11. To maximise consistency between the appraisal process of the South Norfolk Local Development Framework (LDF) and the NRP Development Brief SPD it was decided, following a review of the SA Framework for the SA of the South Norfolk LDF, that the same SA Framework should be applied in the SA of the NRP Development Brief SPD. The sustainability objectives provided the main tool for assessing the Development Brief SPD, and comprised 22 objectives:

SA objective	
Environment	
ENV1	To maintain and enhance biodiversity, geodiversity, species and habitat quality, and avoid habitat fragmentation
ENV2	To reduce vulnerability to climate change, including minimising the risks from flooding.
ENV3	To maximise the use of renewable energy solutions and reduce contributions to climate change.
ENV4	To reduce the effect of traffic on the environment
ENV5	To improve air quality and minimise noise, vibration and light pollution
ENV6	To maintain and enhance the distinctiveness and quality of landscapes, townscapes and the historic environment
ENV7	To minimise the loss of undeveloped land and conserve and improve the quality of soil resources
ENV8	To improve water qualities and provide for sustainable sources of supply and sustainable use
ENV9	To minimise the production of waste and increase recycling.
Social	
S1	To provide everybody with the opportunity to live in a decent, suitable and affordable home.
S2	To reduce poverty, inequality and social exclusion.
S3	To offer opportunities for all sections of the population to have rewarding and satisfying employment.
S4	To improve accessibility to essential services, facilities and the workplace, particularly for those most in need.
S5	To improve the education and skills of the population overall.
S6	To improve the health of the population overall.
S7	To encouraging local community identity and foster mixed communities with co-operative attitudes, helping to reduce anti-social activity.
S8	To improve the quality of where people live.
Economic	
EC1	To encourage sustained economic growth
EC2	To encourage and accommodate both indigenous and inward investment promoting a positive image of the District.
EC3	To encourage efficient patterns of movement in support of economic growth.
EC4	To improve the social and environmental performance of the economy.
EC5	To improve the economic performance in rural areas

Stage B: Developing and refining options and assessing effects

12. The options for the NRP Development Brief SPD and the document itself were appraised against the SA objectives in the SA Framework. The sets of options/ components that were appraised as part of this SA include:

- Broad options which focused on alternative plot ratios for development within NRP and transport strategies that are used to access the site.
 - Detailed options which explored alternative ways of expressing the preferred broad option (in terms of layouts of development at NRP). Given the physical separation and specific environment of Colney Hall compared to the remainder of NRP, separate expressions of development were prepared for development at the 'Main Site' and Colney Hall.
 - The Vision, Objectives and Design Principles of the preferred option which comprises the consultation draft Development Brief SPD (which accompanies this SA Report)
13. **Figure I** below describes each of these appraisal stages setting out what was appraised, how the results of the appraisals were used and how this fed into the preparation of the Development Brief.

Stage C: Preparing the Sustainability Appraisal report

14. This is the non-technical summary of the full SA report, which follows this document. The SA report includes the SA findings on the likely significant effects on the environment, and social and economic factors of the NRP Development Brief SPD, and outlines the reasons for selecting the alternatives/options dealt with. It also sets out the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects or maximising the positive effects on the environment of implementing the plan. The SA report has been written to meet all the requirements of the SEA Directive, and these are signposted in the SA report.

Stage D: Consulting on the SPD and SA report

15. The output from Stages A to C is the SA report. It has been prepared for consultation alongside the consultation version of the NRP Development Brief SPD. Consultation responses will be taken into account in developing the final version of the SPD, and any comments received on the SA will be considered and addressed in further iterations of the SA.

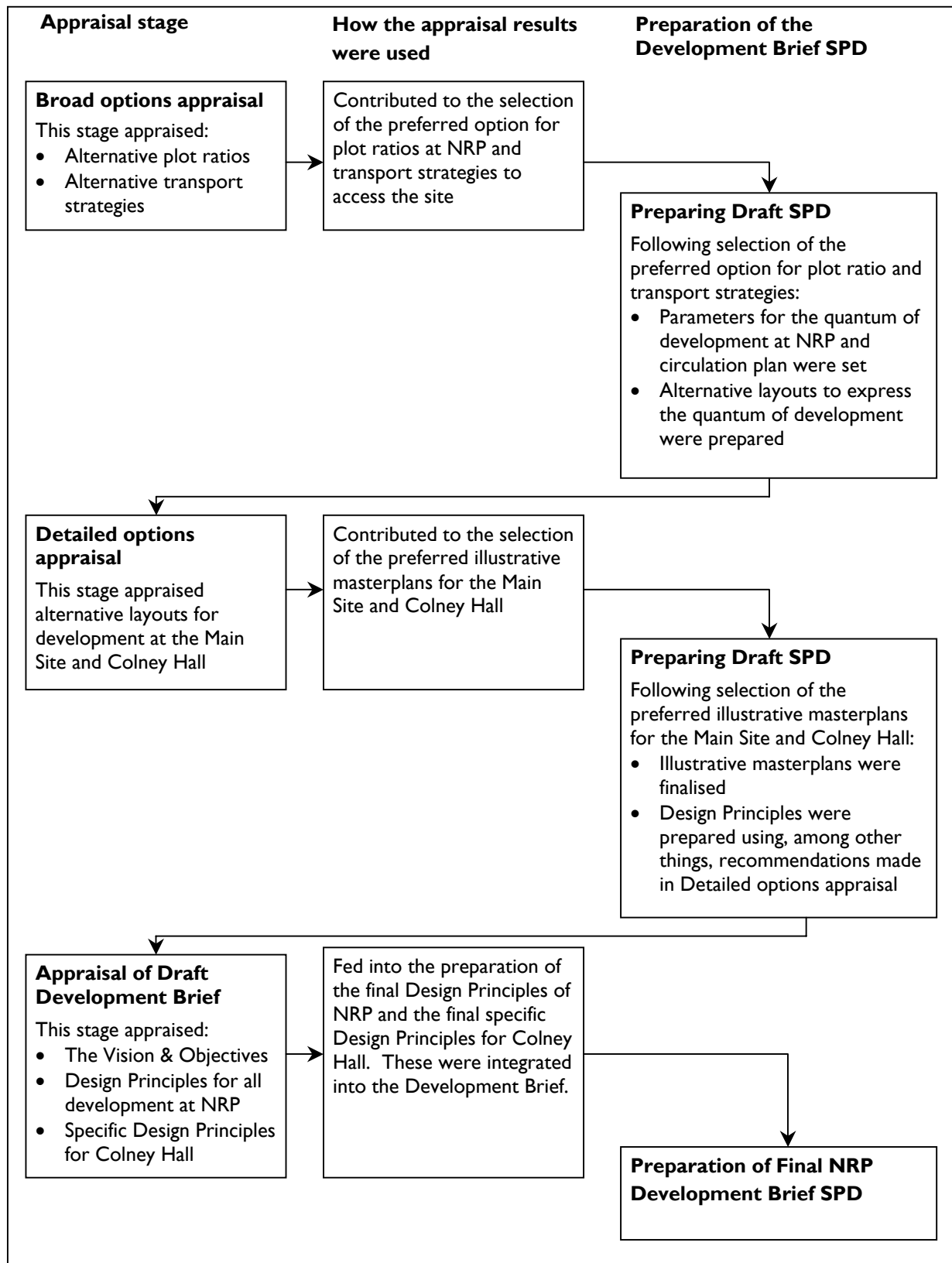
Stage E: Monitoring and Implementation of the NRP Development Brief SPD

16. This SA report sets out recommendations for monitoring the sustainability effects of the NRP Development Brief SPD. It also provides recommendations for a process for dealing with adverse or unexpected effects.

SUSTAINABILITY CONTEXT OF NRP

17. NRP is located on the urban fringe of Norwich city and lies immediately outside the city boundary on the south-west side of the River Yare opposite the University of East Anglia campus. There are two components which make up NRP, namely existing developments and those additional areas allocated for research and development uses as part of the South Norfolk Local Plan.

Figure I: The appraisal stages of the SA and how the results fed into the preparation of the Development Brief



18. The sustainability characteristics of the area include:

- **Landscape:** the main site is characterised by its open nature with broad views and relatively little sense of enclosure. This is exacerbated by the open gently rolling topography, relatively large fields and an absence of significant hedgerows. Its character is essentially agricultural although there is an awareness of adjacent development. Colney Hall has a more complex character stemming from a more varied terrain and woodland cover providing a more intimate landscape. The Hall and its immediate environs enjoy a fine south-easterly prospect.
- **River valley and flooding:** NRP is located within the Yare Valley and so is located close to the river floodplain. However, none of the existing developments or allocated sites are within flood risk areas.
- **Nature Conservation:** there are 9 species featured in the Norfolk Biodiversity Action Plan which have been identified in the local area by the Norfolk Biological Records Centre (NRBC). Whilst there are no designated habitats of national or European importance that are in close proximity to NRP, the area includes a range of habitats that are important to the local area. These include five locally-significant County Wildlife Sites, meadow grazing which borders sections of the River Yare, and scattered trees, plantations and hedgerows.
- **Heritage:** Colney Hall is a Grade II listed building set within the remnant of a historic landscape. Some of the parkland trees and exotics, the walled garden, and remains of ornamental rockwork east of the Hall have heritage value. The most significant heritage element is the south-easterly prospect from the Hall.
- **Water consumption and water resources:** the current water supply network in the area around NRP has reached capacity.
- **Access to recreational facilities and open space:** UEA is located next to Earlham Park and the UEA playing fields, both of which have public access. These areas are important for quality of life and health of the surrounding population.
- **Access:** allocated sites are accessed principally by the Watton Road and its side roads, Hethersett Lane and Colney Lane. Colney Hall is accessed by a private drive from the Watton Road. The Watton Road is characterised by relatively high traffic volumes particularly at peak times when it is close to capacity.
- **Employment:** most of the land in the south of the District is used for agriculture and food related industry, giving this sector great influence despite employing only 15% of the workforce. However, NRP also plays a significant role in the South Norfolk and greater Norwich economy, e.g. the Norfolk and Norwich University Hospital directly employs 5,400 people and indirectly supports 1,000 jobs. The importance of NRP to the region as a whole is acknowledged within the draft Regional Spatial Strategy, being classified as a 'strategic employment site' in draft policy NSR1 and E4.
- **Inward investment:** the District has one of the fastest growing economies in the UK, which is largely building on its strengths in science and technology, healthcare, engineering and food science.

DEVELOPING AND REFINING OPTIONS

Broad options

19. The broad options for the NRP Development Brief SPD focus on alternative plot ratios for development within NRP (at 16, 19 and 24% plot ratios) and alternative transport strategies to access new development at NRP (including a car-dependant, and a mixed public transport and car access strategy).
20. The broad option that was taken forward by South Norfolk Council as the Preferred Option was the mixed public transport and car access strategy with development at 24% plot ratio. This was considered by the Council to be the most beneficial option that balances optimal economic growth, employment creation, improved education and skills with practical, considered environmental mitigation. The findings of the SA were considered in arriving at this decision and recommendations made through the appraisal of the preferred broad option were incorporated in the preparation of the detailed options and Development Brief where appropriate.

Detailed options for the Main site

21. Three expressions of the preferred broad option formed the detailed options for the Main Site. The detailed options comprised a conventional approach to site layout, a parkland style of development and a hybrid option between the conventional and parkland style approaches.
22. The detailed option that was taken forward by South Norfolk Council was the hybrid development option. This was considered by the Council to be the most beneficial option given its economic performance and good environmental standards. The findings of the SA were considered in arriving at this decision and recommendations made through the appraisal of the preferred detailed option for the Main Site were incorporated in the Development Brief where appropriate.

Detailed options for Colney Hall

23. Three expressions of the preferred broad option also formed the detailed options for Colney Hall. The detailed options comprised varying amounts of development in different parts of the estate.
24. The detailed option that was taken forward for the expression of development at Colney Hall by South Norfolk Council comprised an extension to the Hall, development in the rose garden, walled garden, at the pump house, and within the coniferous plantation. This was considered by the Council to be the most beneficial option given its concentration of development in existing developed areas, its potential for integrating opportunities for wildlife and its reduced effect on nearby County Wildlife Sites and River Yare compared to the other options. The findings of the SA were considered in arriving at this decision and recommendations made through the appraisal of the preferred detailed option for Colney Hall were incorporated in the Development Brief where appropriate.

NRP Development Brief SPD

25. Taking the Development Brief SPD as a whole, a number of significant cumulative impacts in relation to the SA objectives have been identified. The potential significant positive cumulative impacts of the SPD include:
- Maximising the use of renewable energy solutions;
 - Reducing contributions to climate change;
 - Providing working accommodation for a range of future users/occupiers to support long-term employment;
 - Improving accessibility to the workplace and essential services and facilities;
 - Improving the education and skills of the population in the area owing to the nature of employment that would be located at NRP which is likely to encourage the provision of highly skilled jobs;
 - Improving the health of the population by improving access to Norfolk and Norwich University Hospital and providing open spaces which are likely to contribute to the health of those who work at NRP and live nearby;
 - Improving the quality of where people live;
 - Encouraging sustained economic growth; and
 - Encouraging and accommodating indigenous and inward investment promoting a positive image of the District.
26. The potentially significant negative cumulative impacts of the SPD in relation to the SA objectives include:
- Reducing the effect of traffic on the environment; and
 - Minimising the loss of undeveloped land and conserving and improving the quality of soil resources.
27. The SA report concludes by making recommendations for the approach to monitor the sustainability effects of the Development Brief SPD.

NEXT STEPS

28. The SA Report is now being published for consultation to provide the statutory environmental bodies and stakeholders, including the public, with an opportunity to express their opinions on the SA Report and to use it as a reference point for commenting on the Development Brief. Please send your comments by Friday 29th June to:

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South Norfolk House
Swan Lane, Long Stratton
Norfolk, NR15 2XE

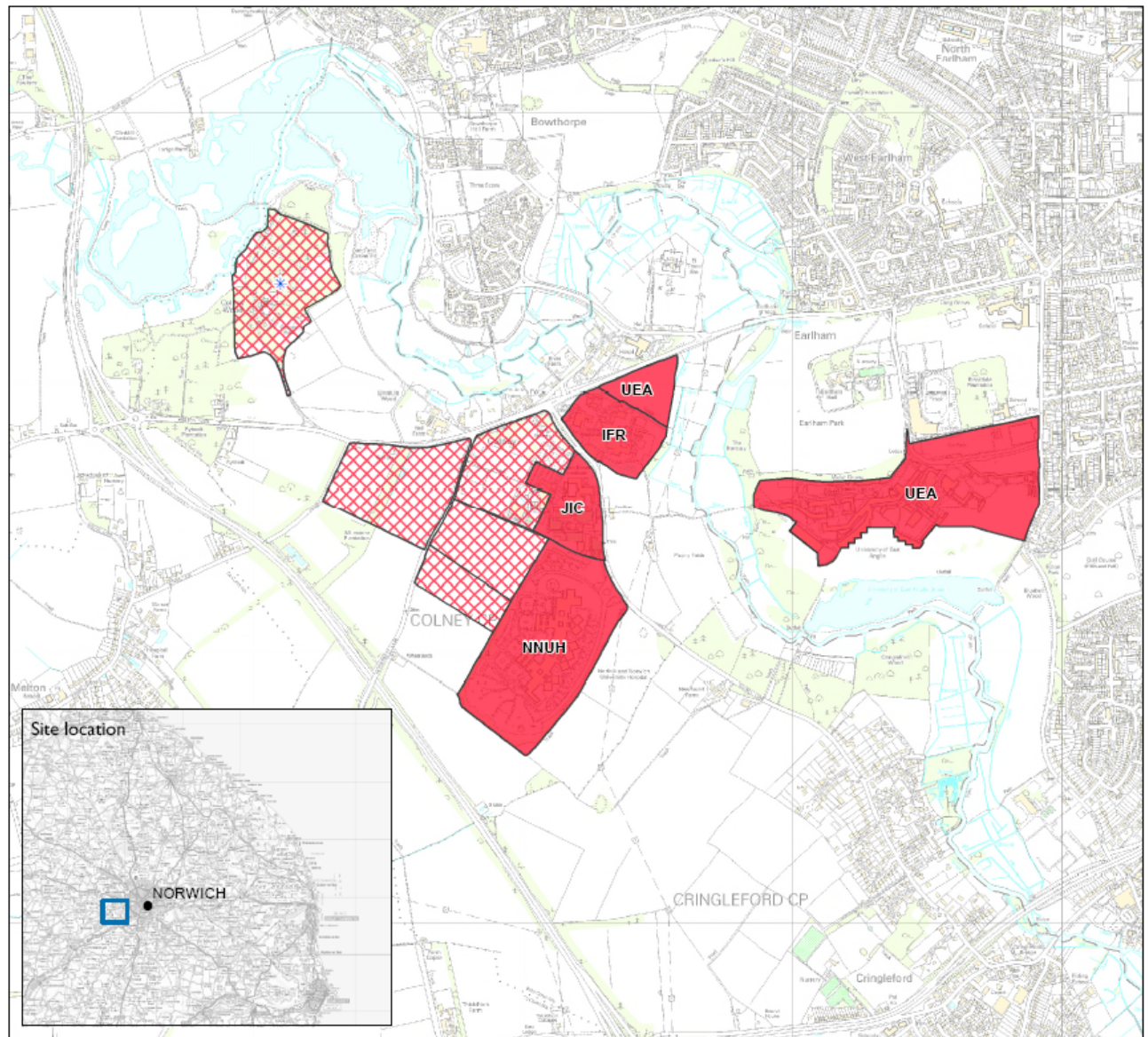
Email: AGomm@s-norfolk.gov.uk
Fax: 01508 533625

I. INTRODUCTION

- I.1. Norwich Research Park (NRP) at Colney currently includes two hospitals and five research institutes, providing research and training in biological, chemical and environmental sciences with a particular emphasis on food research. The organisations that currently constitute NRP include:
- University of East Anglia (UEA), including the School of Nursing and Midwifery
 - Norfolk and Norwich University Hospital (including a Crèche, GP and 'Big C' facilities)
 - John Innes Centre
 - Institute of Food Research
 - Sainsbury Laboratory
 - A range of companies working out of NRP⁴
- I.2. The South Norfolk Local Plan⁵ allocates land to the west of Colney Lane, which is adjacent to existing research and academic institutions and the new Norfolk and Norwich University Hospital, for additional research and development uses. 15 hectares of land at Colney Hall is also allocated for these uses. The location of NRP, its constituent organisations, and the allocated sites for additional development are presented in **Figure I.1**.
- I.3. The Local Plan requires a Development Brief to be prepared for NRP, which will set the principles and parameters for the development of NRP on land allocated for additional research and development uses. The Development Brief will eventually be adopted as a Supplementary Planning Document (SPD). Land Use Consultants (LUC) in conjunction with Sheppard Robson Architects were appointed by South Norfolk Council to prepare this Development Brief.
- I.4. This Sustainability Appraisal Report (SA Report) has been prepared to provide key stakeholders and members of the public with information on the process and findings of the Sustainability Appraisal (SA) undertaken in preparing the Preferred Option of the Draft NRP Development Brief SPD. In particular, this report sets out the likely significant sustainability implications of implementing the Preferred Option.
- I.5. Those with an interest in, or affected by, the Draft Development Brief SPD are encouraged to use this report as a reference point in responding to the consultation on the Preferred Options Document. Comments are also invited on the contents of this SA Report itself. It has been prepared by LUC on behalf of South Norfolk Council.

⁴ The range of companies working out of NRP are listed in **Appendix I**.

⁵ Adopted in 2003 and runs until mid 2006. South Norfolk Council is currently preparing their Local Development Framework which will eventually replace the South Norfolk Local Plan.



Norwich Research Park Development Brief SPD SA/SEA

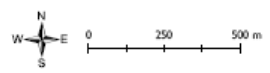
Figure 1.1: Location of NRP and allocated sites for additional development

Key

- Existing development and sites with planning permission
- Allocated sites for research & development uses

Colney Hall has existing DI (Non-residential institutions) and BI(a) (offices) uses. There are also existing DI and BI consents in place at Colney Hall

Abbreviations:
JIC John Innes Centre
UEA University of East Anglia
IFR Institute of Food Research
NNUH Norfolk & Norwich University Hospital



Date: 09/05/2007



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File: \\LUC-LON-NASI\NEWDATA\GIS\3300\3390-01_Norwich_Research_Park\Themes\ArcGISB-2\May07_SA_SEA\3390-03_Fig1-1_Context_May07.mxd

WHAT IS SUSTAINABILITY APPRAISAL?

- 1.6. The preparation of the Draft Development Brief SPD is being subject to a full SA, in line with the Planning and Compulsory Purchase Act 2004 and current planning policy guidance (PPS12). The SA will also be in accordance with the requirements of European Directive 2001/42/EC (known as the Strategic Environment Assessment, or SEA Directive). **Table 1.1** provides a summary of the requirements of the SEA Directive and signposts the relevant sections of the SA Report that are considered to meet these requirements.
- 1.7. The purpose of SA, incorporating SEA, is to promote sustainable development by helping to integrate social, environmental and economic considerations into the preparation of plans⁶. It should be viewed as an integral part of good plan-making, involving ongoing iterations to identify and report on significant effects of the plan and the extent to which sustainable development is likely to be achieved.

Table 1.1 Summary of the requirements of the SEA Directive and where these have been addressed in the SA Report

Requirements	Where covered in SA Report
Preparation of an environmental report in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and geographical scope of the plan or programme, are identified, described and evaluated. The information to be given is (Art. 5 and Annex I):	
• An outline of the contents, main objectives of the plan or programme, and relationship with other relevant plans and programmes;	Chapters 2 and 4 and Appendix 3
• The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	Chapter 5 and Appendix 4
• The environmental characteristics of areas likely to be significantly affected	Chapter 5 and Appendix 4
• Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	Chapter 5 and Appendix 4
• The environmental protection objectives, established at international, Community or national level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;	Chapter 5 and Appendix 4
• The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors. (These effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects);	Chapter 7 and Appendices 7, 9, 11, 12, 14 and 15
• The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	Chapter 7
• An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	Chapter 7
• A description of measures envisaged concerning monitoring in accordance with Art. 10;	Chapter 8
• A non-technical summary of the information provided under the above headings	Chapter 1
The report must include the information that may reasonably be required taking into account current knowledge and methods of assessment, the contents and level of detail in the plan or programme, its stage in the decision-making process and the extent to which certain matters are more appropriately assessed at different levels in that process to avoid duplication of the assessment (Art. 5.2)	Throughout SA Report

⁶ *Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents*. Office of the Deputy Prime Minister, November 2005.

Requirements	Where covered in SA Report
Consultation:	
Authorities with environmental responsibility, when deciding on the scope and level of detail of the information which must be included in the environmental report (Art. 5.4)	Paras 3.4-3.5 and Appendix 2
Authorities with environmental responsibility and the public, shall be given an early and effective opportunity within appropriate time frames to express their opinion on the draft plan or programme and the accompanying environmental report before the adoption of the plan or programme (Art. 6.1, 6.2)	Paras 1.10 and 3.4-3.5 and Appendix 2
Other EU Member States, where the implementation of the plan or programme is likely to have significant effects on the environment of that country (Art. 7).	N/A
Taking the environmental report and the results of the consultations into account in decision-making (Art. 8):	Paras 3.4-3.5 and Appendix 2
Provision of information on the decision: When the plan or programme is adopted, the public and any countries consulted under Art.7 must be informed and the following made available to those so informed: - the plan or programme as adopted - a statement summarising how environmental considerations have been integrated into the plan or programme and how the environmental report of Article 5, the opinions expressed pursuant to Article 6 and the results of consultations entered into pursuant to Art. 7 have been taken into account in accordance with Art. 8, and the reasons for choosing the plan or programme as adopted, in the light of the other reasonable alternatives dealt with; and - the measures decided concerning monitoring (Art. 9)	Not applicable at this stage
Monitoring of the significant environmental effects of the plan's or programme's implementation (Art. 10)	Not applicable at this stage

- I.8. In conducting the SA, LUC has assessed the sustainability performance of the emerging NRP Development Brief SPD using a series of sustainability objectives. The SA is required to be taken into account in the preparation of the SPD, for example, by amending the plan where considered appropriate to maximise its benefits and minimise its adverse effects. The SA is intended to help South Norfolk Council work towards achieving sustainable development in line with the UK Sustainable Development Strategy.

WHAT IS SUSTAINABLE DEVELOPMENT?

Sustainable Development is “development which meets the needs of the present without compromising the ability of future generations to meet their own needs”⁷. The UK Government’s Sustainable Development Strategy sets out five principles which will underpin the achievement of sustainable development, these are:

Living Within Environmental Limits

Respecting the limits of the planet’s environment, resources and biodiversity – to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.

Ensuring a Strong, Healthy and Just Society

Meeting the diverse needs of all people in existing and future communities, promoting personal wellbeing, social cohesion and inclusion, and creating equal opportunity for all.

⁷ *Securing the Future – UK Sustainable Development Strategy*. Department for Environment, Food and Rural Affairs, March 2005.

Achieving a Sustainable Economy

Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who impose them (polluter pays), and efficient resource use is incentivised.

Promoting Good Governance

Actively promoting effective, participative systems of governance in all levels of society – engaging people’s creativity, energy, and diversity.

Using Sound Science Responsibly

Ensuring policy is developed and implemented on the basis of strong scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle) as well as public attitudes and values.

STRUCTURE OF THE SA REPORT

- I.9. This Chapter introduces the SA of the NRP SPD Preferred Option. The remainder of this report is structured into the following sections:

Chapter 2: NRP Development Brief Supplementary Planning Document, provides background to the SPD and a summary of its Objectives and Vision.

Chapter 3: Methodology, describes the SA process, the approach used and the specific SA tasks undertaken.

Chapter 4: Sustainability Requirements of other Relevant Plans and Programmes, discusses the SPD’s relationship with other relevant plans, policy guidance and strategies.

Chapter 5: Sustainability Context for NRP, characterises the area in terms of sustainability issues identified from the baseline information gathered.

Chapter 6: Sustainability Appraisal Framework, describes the SA objectives for assessing the NRP Development Brief SPD.

Chapter 7: Appraisal of NRP Development Brief SPD components, sets out the main findings from the appraisal of the broad options, detailed options and NRP Development Brief SPD.

Chapter 8: Monitoring, makes initial recommendations for monitoring the sustainability effects of implementing the SPD.

HOW TO COMMENT ON THE REPORT

- I.10. This SA Report is being published for consultation to provide the statutory environmental bodies⁸ and stakeholders with an opportunity to express their

⁸ The statutory environmental bodies that are required to be consulted on the SA are the Countryside Agency, English Heritage, English Nature and the Environment Agency.

opinions on the SA Report and to use it as a reference point in commenting on the NRP SPD Preferred Option. Please send your comments by Friday 29th June to:

Alan Gomm
Planning Policy Manager
South Norfolk Council
South Norfolk House
Swan Lane
Long Stratton
Norfolk, NR15 2XE

Email: AGomm@s-norfolk.gov.uk

Fax: 01508 533625

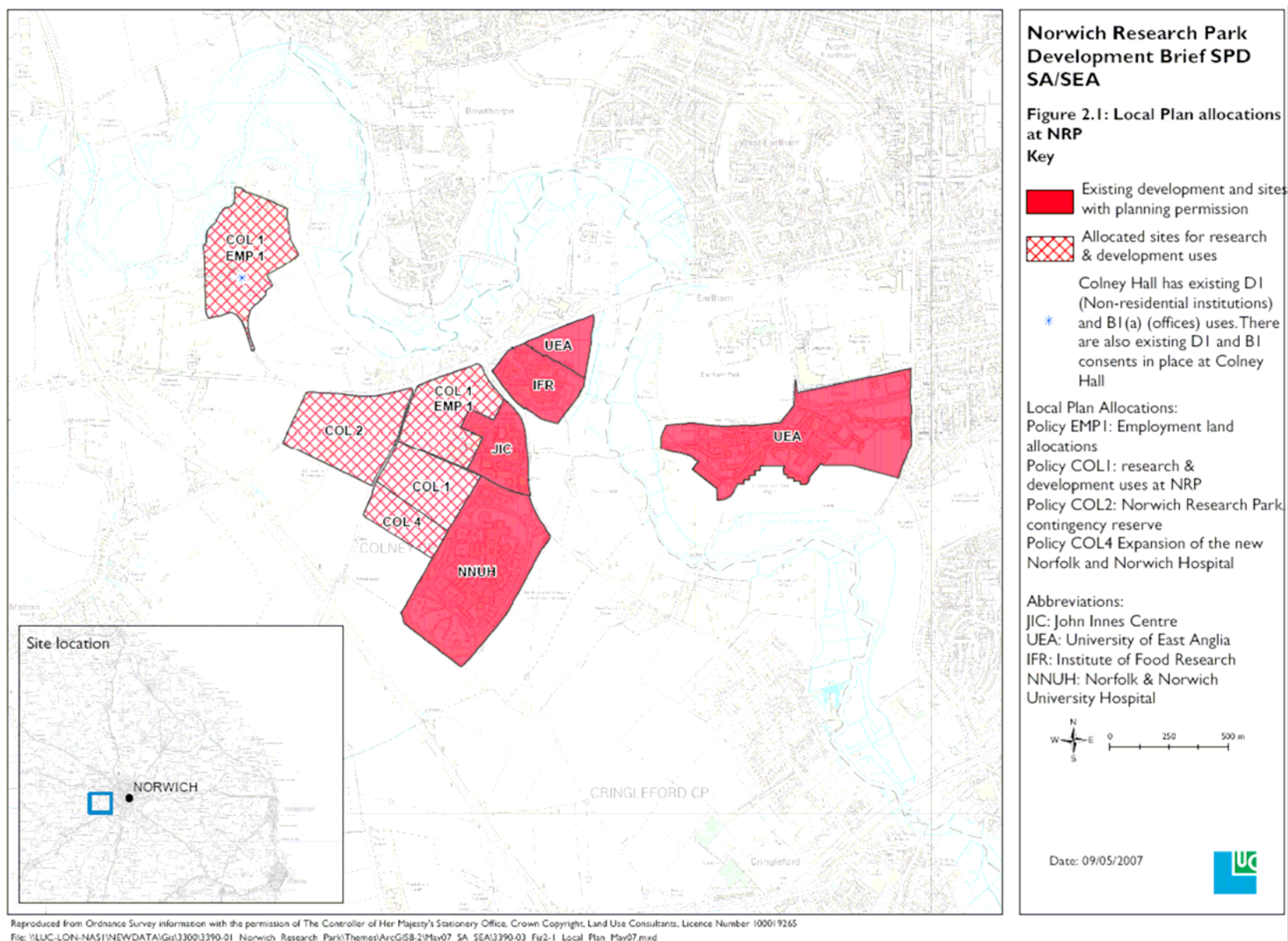
2. NRP DEVELOPMENT BRIEF SUPPLEMENTARY PLANNING DOCUMENT

THE PLANNING CONTEXT

- 2.1. The South Norfolk Local Plan (adopted in 2003) allocates land to the west of Colney Lane adjacent to the new Norfolk and Norwich University Hospital and at Colney Hall as an extension to NRP. The following Local Plan policies describe this allocation:
- Policy EMPI: *Employment land allocations* identifies 35 hectares of land for restricted employment development uses at NRP.
 - Policy COL 1: *Research and development uses at Norwich Research Park* states that ‘*planning permission will be granted for research and development uses on land...at the Norwich Research Park, Colney*’.
 - Policy COL 2: *Norwich Research Park, contingency reserve* allocates 14 hectares of land between Hethersett Lane and Watton Road (BI 108) as a contingency reserve for research and development uses at NRP.
 - Policy COL 4: *Expansion of the Norfolk and Norwich Hospital* allocates 5ha of land between the Norfolk and Norwich Hospital and Hethersett Lane ‘*for hospital and hospital related activities in addition to research and development uses permitted by policy COL 1 at the Norwich Research Park*.’
- 2.2. The allocations for additional development as set out in the Local Plan policies above are presented in **Figure 2.1**.

THE NRP DEVELOPMENT BRIEF SPD

- 2.3. Section 3 (Norwich Research Park) of Part Two of the extant Local Plan (Individual Settlement Proposals – Colney) states that a development brief for the NRP is to be prepared and will be published as Supplementary Planning Guidance (SPG).
- 2.4. Development briefs provide a stepping stone between the provision of planning policy and the form and detail of a planning application. The NRP Development Brief therefore has been prepared to guide and co-ordinate the form of development on land allocated as an extension to NRP in the Local Plan policies listed above. As the Brief will be adopted by the Council as a Supplementary Planning Document (SPD), it will be required to expand on those policies that relate to the NRP extension. The role of the NRP Development Brief SPD is summarised in **Figure 2.2**.
- 2.5. For the purposes of the Development Brief, the three allocations to the south of Watton Road (BI 108) are considered sufficiently similar to be grouped together and are referred to as the ‘Core Area’. The Brief gives specific guidance to the Colney Hall site because of its location, which is separate from the core areas, and its different environment.



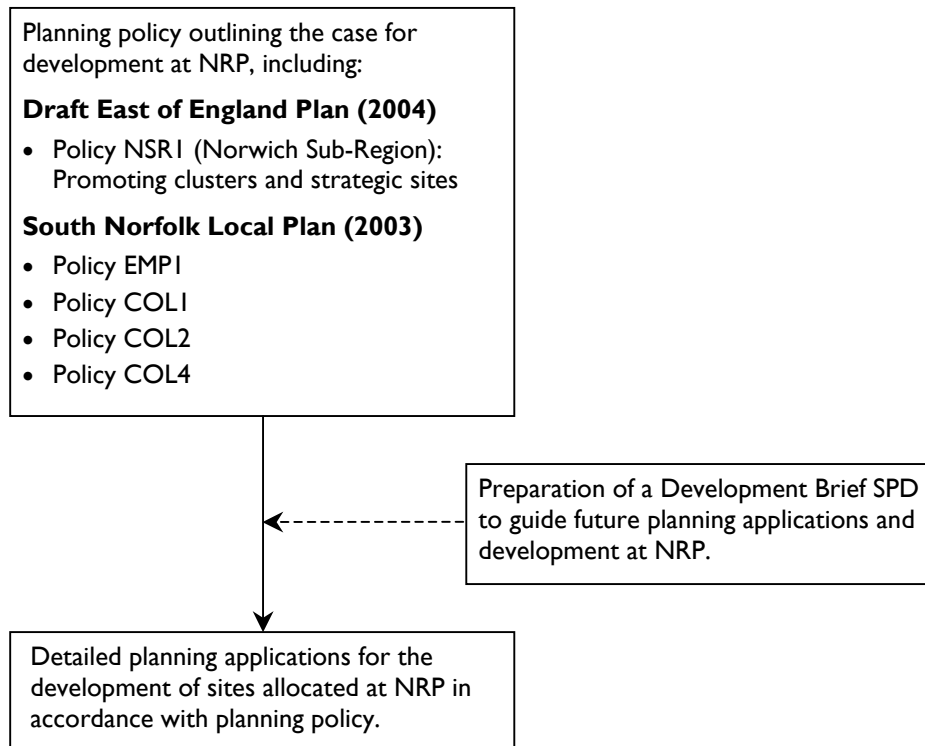


Figure 2.2: Purpose of the NRP Development Brief SPD

Objectives and vision of the Development Brief SPD

- 2.6. The Development Brief SPD provides the parameters within which detailed planning applications for NRP can be prepared. It will be used by the Council in its determination of detailed planning applications for the site. The Brief acknowledges that changes in wider society, the environment (in particular climate change) and in the field of research and development are inevitable. It therefore sets principles and expectations rather than relying on specific levels of restriction.
- 2.7. The overall objectives of the NRP Development Brief SPD have been identified as:
- Implementing allocations and land uses in the Local Plan;
 - Providing developer and landowner certainty over development at NRP;
 - Enhancing the efficiency of the planning process and the processing of planning applications;
 - Promoting high-quality design and innovation; and
 - Reflecting physical constraints and opportunities in the area.
- 2.8. The Vision Statement for the NRP Development Brief SPD is defined as:

The extension to NRP will underpin the international presence of Norwich as a centre of excellence in providing research and training particularly in biological, chemical and

environmental sciences. In acting as a magnet to, and fully serving the diverse needs of, a wide range of indigenous companies and inward investment opportunities, NRP will significantly contribute to the economy of Norwich and the wider area.

NRP will be an exemplar for the sustainable development of research and development parks. It will embrace good design and contribute to the quality of life of local people, by improving provision of local services and facilities. It will make a major contribution to tackling climate change, one of the greatest challenges we are facing, by incorporating energy efficient design and techniques, offsetting carbon emissions and aspiring to carbon neutrality over the life-time of the development.

Status of the Development Brief SPD

- 2.9. While the SPD is currently linked to policies in the saved South Norfolk Local Plan (2003), it is anticipated that the guidance in the SPD will be equally valuable in supplementing the policies and proposals in the emerging South Norfolk Local Development Framework (LDF). The Local Development Scheme (LDS), which indicates the documents that the Council will produce as part of the LDF, envisages the preparation of a SPD for NRP (para. 3.25).
- 2.10. The Companion Guide to PPS12⁹ states that SPDs should be clearly cross-referenced to the relevant development plan document(s) policies they support. Therefore, it will be necessary to update the introduction of the SPD to reflect the relevant policies in the Core Strategy DPD, District Wide Development Policies DPD, and Site Specific Allocations DPD once they have been produced.

⁹ *Creating Local Development Frameworks. A Companion guide to PPS 12. ODPM, 2004.*

3. METHODOLOGY

- 3.1. The SA of the NRP Development Brief SPD has been undertaken in line with the Government's SA guidance¹⁰, and seeks to meet the requirements of both the Planning and Compulsory Purchase Act 2004 and the SEA Directive (European Directive 2001/42/EC). **Table 3.1** is an extract from the Government's SA guidance and sets out the main stages of the plan-making process and shows how these link to the SA process.

Table 3.1 Corresponding stages in plan-making and SA

SPD Stage 1: Pre-production – Evidence Gathering
SA stages and tasks
Stage A: Setting context and objectives, establishing the baseline and deciding on the scope • A1: Identifying other relevant plans, programmes, and sustainability objectives • A2: Collecting baseline information • A3: Identifying sustainability issues and problems • A4: Developing the SA Framework • A5: Consulting on the scope of the SA
SPD Stage 2: Production – Prepare draft SPD
SA stages and tasks
Stage B: Developing and refining options and assessing effects • B1: Testing the SPD objectives against the SA Framework • B2: Developing the SPD options • B3: Predicting the effects of the draft SPD • B4: Evaluating the effects of the draft SPD • B5: Mitigating adverse effects and maximising beneficial effects • B6: Proposing measures to monitor significant effects of implementing the SPD.
Stage C: Preparing the Sustainability Appraisal Report • C1: Preparing the SA Report
Stage D: Consulting on the SPD Preferred Option and the SA Report • D1: Public participation on the SPD Preferred Option and SA Report • D2: Appraising significant changes
SPD Stage 3: Adoption and Monitoring
SA stages and tasks
• D3: Making decisions and providing information
Stage E: Monitoring the significant effects of implementing the SPD • E1: Finalising aims and methods for monitoring • E2: Responding to adverse effects

¹⁰ *Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents*. Office of the Deputy Prime Minister, November 2005.

STAGES IN SUSTAINABILITY APPRAISAL

- 3.2. The SA process conducted during the preparation of the NRP Development Brief SPD is described in detail below:

Stage A: Setting the Context and Scope

- 3.3. LUC began the SA process by collating information relevant to establishing the scope and level of detail of the appraisal to be conducted for the NRP Development Brief SPD. This involved the following main tasks:
- Review of other relevant plans, programmes and strategies (see **Chapter 4**).
 - Collection of baseline information and characterisation of South Norfolk and NRP (see **Chapter 5**).
 - Identification of key sustainability issues for NRP (see **Chapter 5**).
 - Identification of a SA framework made up of objectives, sub-objectives and associated indicators and targets (see **Chapter 6**).

Relationship with the SA of the Core Strategy

South Norfolk Council is preparing the South Norfolk Local Development Framework (LDF), as required, in accordance with the Planning and Compulsory Purchase Act. The Council is currently undertaking the SA of the LDF, including the Core Strategy and Site Specific Proposals. The SA Scoping Report (Consultation Draft) for the LDF was published in December 2005, and includes much information of relevance to the SA of the NRP SPD.

The ODPM's SA guidance states that, in most cases, the SA of SPDs will draw extensively on appraisals undertaken at the higher level of policies within the Development Plan (para. 4.1.10). It is anticipated that when producing the SA on SPDs, SA material from a RSS revision, DPD or other SPD will be used, particularly for Stage A of the process (**Table 3.1**). This approach is being followed in the preparation of the SA Scoping Report prepared by South Norfolk Council. The key elements that have been used to feed into the SA of the NRP SPD include:

- The list and review of relevant plans and programmes to the South Norfolk LDF, as presented in Appendix 1 (pages 41-43) and Appendix 2 (pages 45-98) of the LDF SA Scoping Report.
- Baseline information providing the context of South Norfolk, as presented in Section 3 (pages 8-11) of the LDF SA Scoping Report.
- Key sustainability issues for South Norfolk, as presented in Section 4 (pages 12-13) and Appendix 3 (pages 99-109) of the LDF SA Scoping Report.
- The SA Framework presented in Section 5 (pages 14-38) of the LDF SA Scoping Report.

Consultation on the Scoping Report

- 3.4. The findings of this work were set out in a SA/SEA Scoping Report, which was sent to the four SEA 'Consultation Bodies' (i.e. the Countryside Agency, English Heritage, English Nature and the Environment Agency), organisations at NRP and a number of other key stakeholders, such as local authorities and interest groups. The list of consultees is presented in **Appendix 1**. The consultees were given five weeks to respond (from 23 June to 31 July 2006).
- 3.5. The consultation responses were generally favourable and provided constructive advice and information, particularly in relation to the baseline and key sustainability issues. A summary of the consultation responses is set out in **Appendix 2** along with the proposed actions to address them.

Stage B: Developing and refining options and assessing effects

- 3.6. The SA of the NRP Development Brief SPD has involved the appraisal of three sets of options/components. Many of the sustainability recommendations identified through these appraisals have now been incorporated into the consultation version of the SPD (January 2007).
- 3.7. The sets of options/components that were appraised as part of this SA include:
- Broad options for the draft NRP Development Brief SPD which focused on alternative plot ratios for development within NRP and transport strategies.
 - Detailed options which explored alternative ways of expressing the preferred broad option at the NRP Main Site and Colney Hall (in terms of broad layouts of development).
 - The Vision, Objectives and Design Principles of the preferred option which comprises the consultation draft Development Brief SPD (which accompanies this SA Report).
- 3.8. The SEA Directive requires '*reasonable alternatives*' to be taken into account, and so not every possible alternative needs to be considered. In some instances, other policy or sustainability considerations pre-determine which approach(s) cannot be taken forward, effectively ruling out some options.
- 3.9. As part of the SA, the two sets of options (broad and detailed) and the preferred option for the SPD were appraised against the SA objectives to identify the sustainability implications of the options and predict and assess their likely effects. The findings of these appraisals are presented in this SA Report, with the detailed appraisal matrices in **Appendices 7, 9, and 11-15**. The appraisal matrices also include recommendations, which seek to maximise the benefits and minimise any adverse effects.

Stage C: Preparing the Sustainability Appraisal Report

- 3.10. This document is the SA Report. It has been prepared to set out the likely significant effects on the environment, society and the economy of implementing the NRP Development Brief SPD and the alternatives considered in preparing the SPD. It

outlines the reasons for selecting the Preferred Option and the measures envisaged to maximise the benefits and minimise any adverse effects of the SPD.

- 3.11. The SA Report has been prepared taking into account the requirements of the SEA Directive for an 'Environmental Report', as sign-posted in **Table I.1**.

Stage D: Consulting on the SPD and the SA Report

- 3.12. This SA Report has been produced for consultation alongside the consultation version of the NRP Development Brief SPD. Details of how to comment on this SA Report are set out on page 5. Any responses received from consultees on the sustainability effects of the SPD and the content of this SA Report will be considered in producing the final SPD for adoption in 2007.

Stage E: Monitoring Implementation of the SPD

- 3.13. The purpose of SA monitoring is to monitor the effects of implementing the SPD to detect any significant adverse effects which were not foreseen in undertaking this appraisal. This monitoring will take place following adoption and implementation of the SPD.
- 3.14. LUC has not been commissioned to undertake the SA monitoring. However, this SA Report includes a description of measures envisaged concerning monitoring of the NRP Development Brief SPD, in accordance with the requirements of the SEA Directive and Government SA Guidance. This is discussed in **Chapter 8** of this SA Report.

4. SUSTAINABILITY REQUIREMENTS OF OTHER RELEVANT PLANS AND PROGRAMMES

What the SEA Directive requires:

The Environmental Report should provide information on:

1. "the relationship [of the plan or programme] with other relevant plans and programmes" (Annex I(a))
2. "the environmental protection objectives, established at international, [European] Community or national level, which are relevant to the plan or programme ... and the way those objectives and any environmental considerations have been taken into account during its preparation" (Annex I (a), (e))

- 4.1. The first stage of SA involved identifying plans and programmes which are relevant to the NRP Development Brief SPD. This task was undertaken during the scoping stage (Stage A) of the SA process.
- 4.2. The SA Scoping Report for the South Norfolk LDF identified a large number of international and national level plans and programmes referred to in the SEA Directive, as well as relevant regional and local plans and strategies, in accordance with Annex 5 of the ODPM's SA Guidance¹¹. A small number of additional plans and programmes were identified in the scoping stage to this SA Report, largely based on comments received from stakeholder feedback on the LDF SA Scoping Report. The full list of plans and programmes considered to be relevant to the NRP Development Brief SPD is summarised in **Table 4.1**.
- 4.3. To fulfil requirement (e) in Annex I of the SEA Directive, plans and programmes considered relevant to the NRP Development Brief SPD need to be reviewed to:
 - identify the main purpose of the plan;
 - describe any environmental or sustainability objectives and targets that it contains; and
 - document how the SA will ensure that they have been taken into account in the preparation of the NRP Development Brief SPD.
- 4.4. The majority of the plans and programmes in **Table 4.1** have already been reviewed as part of the LDF SA Scoping Report. The LDF SA assumes that higher tier plans direct the content of those below them and so have been specifically addressed as part of the SA of the Draft East of England Plan. Therefore, assessments were not given for these documents. The same approach has been taken in the scoping stage to this SA Report; those higher tier plans for which assessments are not provided are

¹¹ SA Scoping Report of South Norfolk Council Local Development Framework (December 2005). South Norfolk Council. Pages 41-43.

denoted with an 'R' in the last column of **Table 4.1**. The documents that were reviewed as part of the LDF SA Scoping Report are denoted with an 'LDF' in the last column of **Table 4.1** and their review is presented in **Appendix 3**. The plans and programmes that have been reviewed as part of this SA Scoping Report are denoted with a '*' in the final column of **Table 4.1**.

4.5. The reviews of relevant plans and programmes are presented in **Appendix 3** to this SA Report. The review of those additional plans and programmes identified in this SA Scoping Report are highlighted in light grey in **Appendix 3**. Each review includes:

- The key objectives relevant to the Local Development Document and SA;
- Key targets and indicators;
- Implications of the plan for the Local Development Document; and
- Implications for the SA.

Table 4.1 List of plans, programmes and sustainability policy objectives relevant to the NRP SPD

Plan, programme, sustainability policy objective	
International	
The World Summit on Sustainable Development (WSSD), Johannesburg Declaration (2002)	LDF
The Kyoto Protocol and the UN Framework Convention on Climate Change (1992)	R
The UN Millennium Declaration and Millennium Development Goals (MDGs) (2000)	R
The Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)	R
The Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979)	R
The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat (1971)	R
EC Council Directive 75/442/EEC: Waste Directive (1975)	R
EC Council Directive 76/160/EEC: Bathing Water Quality (1976)	R
EC Council Directive 79/409/EEC: The Conservation of Wild Birds (1979)	R
EC Council Directive 85/337/EEC and 97/11/EC: Effects of Certain Public and Private Projects on the Environment Directive (1985 and 1997)	R
EC Council Directive 91/271/EEC: Urban Waste Water Treatment (1991)	R
EC Council Directive 91/676/EEC: Water Pollution Caused by Nitrates from Agricultural Sources: Nitrates (1991)	R
EC Council Directive 92/43/EEC: The Conservation of Natural Habitats and of Wild Fauna and Flora (1992) (The Habitats Directive)	R
EC Council Directive 94/62/EC: Packaging and Packaging Waste (1994)	R
EC Council Directive 96/62/EC: Air Quality Framework Directive (1996) with successive Daughter Directives (1999-2002)	R
EC Council Directive 96/82/EC: Hazardous Substances Directive	R
EC Council Directive 98/83/EC: Drinking Water Directive (1998)	R
EC Council Directive 1999/31/EC: The Landfill of Waste (1999)	R
EC Council Directive 2000/60/EC: Water Framework Directive (2000)	LDF
EC Council Directive 2001/77/EC: The Promotion of Electricity from Renewable Energy (2001)	R

Plan, programme, sustainability policy objective	
EC Council Directive 2003/30/EC: The Promotion of Bio-Fuels for Transport (2003)	R
National	
Choosing Health Public White Paper (2004)	LDF
Climate Change: the UK Programme (DETR 2000)	R
Energy White Paper: Our Energy Future – creating a low carbon economy (DTI 2003)	LDF
Farming and Food Strategy: Facing the Future (Defra 2002)	R
National Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Defra 2000)	R
National Service Framework (NSF) for Older People (2001)	LDF
Rural Strategy (Defra 2004)	LDF
Rural White Paper: Our Countryside: The Future - A Fair Deal for Rural England (DETR 2000)	R
Saving Lives: Our Healthier Nation White Paper (DoH 1999)	LDF
Securing the Future: the UK Government Sustainable Development Strategy (2005)	LDF
State of Nature – Lowlands – Future Landscapes for Wildlife (English Nature 2004)	R
State of the Countryside Report (Countryside Agency 2005)	LDF
Strategy for Sustainable Farming and Food (Defra 2002)	LDF
Sustainable Communities: Building for the Future (ODPM 2003)	R
Tackling Health Inequalities -A programme for Action (2003)	LDF
Transport Ten Year Plan (Department of Transport 2000)	R
UK Waste Strategy (Defra 2000)	LDF
UK Biodiversity Steering Group – The UK Biodiversity Action Plan	LDF
Wildlife and Countryside Act (1981, as amended)	R
Working with the Grain of Nature – A Biodiversity Strategy For England (DEFRA 2002)	R
National: Planning Policy Guidance Notes and Planning Policy Statements	
Planning Policy Statement 1: Delivering Sustainable Communities (ODPM 2005)	LDF
Planning Policy Guidance 2: Green Belts (DoE 1995)	R
Planning Policy Guidance 3: Housing (ODPM 2000)	LDF
Planning Policy Guidance 4: Industrial and Commercial development and Small Firms (2001)	LDF
Planning Policy Statement 6: Planning for Town Centres (ODPM 2005)	LDF
Planning Policy Statement 7: Sustainable Development in Rural Communities (ODPM 2004)	LDF
Planning Policy Guidance 8: Telecommunications (2001)	LDF
Planning Policy Statement 9: Biodiversity and Geological Conservation (ODPM 2005)	LDF
Planning Policy Statement 10: Planning for Sustainable Waste Management (ODPM 2005)	LDF
Planning Policy Statement 12: Local Development Frameworks (ODPM 2004)	LDF
Planning Policy Guidance 13: Transport (DETR 2001)	LDF
Planning Policy Guidance 14: Development on Unstable Land (1990)	LDF
Planning Policy Guidance 15: Planning and the Historic Environment (DoE 1994)	LDF
Planning Policy Guidance 16: Archaeology and Planning (DoE 1993)	LDF
Planning Policy Guidance 17: Planning for Open Space, Sport and Recreation (2002)	LDF
Planning Policy Guidance 21: Tourism (1992)	R
Planning Policy Statement 22: Renewable Energy (ODPM 2004)	LDF
Planning Policy Statement 23: Planning and Pollution Control (ODPM 2004)	LDF
Planning Policy Guidance 24: Planning and Noise (1994)	LDF

Plan, programme, sustainability policy objective	
Planning Policy Guidance 25: Development and Flood Risk (ODPM 2001)	LDF
Regional	
Affordable Housing Strategy: The Provision of Affordable Housing in the East of England 1996-2021 (2003)	R
Culture: A Catalyst for Change; A strategy for cultural development for the East of England (Living East 1999+)	R
Draft RSS14: East of England Plan (EERA 2004)	LDF
East of England: The State of the Countryside (Countryside Agency 2004)	R
East of England European Strategy 2003-2004 (East of England European Partnership 2003)	R
East of England Regional Social Strategy (2004)	LDF
East of England Regional Waste Management Strategy (East of England Region Waste Technical Advisory Body 2002)	LDF
Framework for Regional Employment and Skills Action (FRESA) (EEDA, 2003)	R
Integrated Regional Strategy 'Sustainable Futures' (EERA 2005)	LDF
International Business Strategy; Consultation Draft (2003)	R
Living with Climate Change in the East Of England (East of England Sustainable Development Roundtable 2003)	R
Our Environment, Our Future: Regional Environment Strategy for the East of England (EERA and EEEF 2003)	LDF
Prioritisation in the East of England (2003)	R
Regional Economic Strategy (EEDA, 2001)	LDF
Regional Emphasis Document SR2004 (2003)	R
Regional Housing Strategy for the East of England: Strategy Document 2005-2010 (EERA 2005)	LDF
Regional Planning Guidance for East Anglia (GOEAST 2000)	LDF
Regional Social Strategy (EERA 2003)	R
Regional Sustainable Development Framework (2001)	R
Regional Transport Strategy (2004)	R
Regional Waste Strategy (Regional Waste Technical Advisory Body 2002)	R
Sustainable Communities in the East of England (ODPM 2003)	LDF
Sustainable Development Framework for the East of England (EERA 2001)	LDF
Sustainable Tourism Strategy for the East of England – Draft (East of England Tourist Board 2004)	LDF
Towards Sustainable Construction, A Strategy for the East of England (EP, CE, GO-E, PECT 2003)	R
Towns and Cities Strategy and Action Plan, Urban Renaissance in the East of England (2003)	R
Water Resources for the future: A Strategy for Anglian Region (Environment Agency, 2001)	R
Woodland for Life: The Regional Woodland Strategy for the East of England (EERA & the Forestry Commission, 2003)	R
County	
Municipal Waste Strategy for Norfolk (2002)	LDF
Norfolk Ambition: The Community Strategy for Norfolk 2003-2023 (2003)	LDF
Norfolk Biodiversity Action Plan (2004)	LDF
Norfolk Biodiversity SPG	LDF
Norfolk Live - Cultural Strategy –2005 – 2010 (2005)	LDF

Plan, programme, sustainability policy objective	
Norfolk Local Transport Plan 2000-2005	LDF
Norfolk Minerals Local Plan (2004, final publication pending)	LDF
Norfolk Residential Design Guide (1998)	LDF
Norfolk State of the Environment Report (2003)	LDF
Norfolk Structure Plan 2003 (1999)	LDF
Norfolk Waste Local Plan (2000, currently under review)	LDF
Shaping the Future: Towards a Strategy for Social Cohesion in Norfolk (2000)	LDF
River catchment	
Broadland Rivers Catchment Flood Management Plan (CFMP)	*
Broadland Rivers Catchment Abstraction Management Strategy (Environment Agency 2006)	*
District	
Crime Reduction Strategy (2003)	LDF
Corporate Equality Plan (2003)	LDF
Economic Development Strategy (2004)	LDF
Empty Homes Strategy (2003)	LDF
Environment Strategy (Draft 2005)	LDF
Health Strategy (Draft 2005)	LDF
Housing Strategy (2004)	LDF
Landscape Assessments by LUC (2000 and updated)	LDF
Leisure/Culture & Countryside Strategy (Draft 2005)	LDF
Local Agenda 21 Strategy (2000)	LDF
South Norfolk Alliance – Community Strategy (2004)	LDF
South Norfolk Cycling Strategy (2005)	LDF
Strategy for travellers and gypsies in Norfolk (2005-2008)	LDF
The Broads Plan	LDF
Tourism Strategy (2004)	LDF
Towards Stronger Communities: South Norfolk's Strategy for Community Cohesion, Diversity, Social Inclusion and Participation (Draft 2005)	LDF

- 4.6. When considering the review of plans and programmes, it is important to recognise that no list of plans and programmes can be exhaustive. New and revised plans and programmes emerge on a regular basis. The review of plans and programmes seeks to identify the key plans and programmes currently in place and to distil key messages from these.

5. SUSTAINABILITY CONTEXT FOR NRP

Annex I of the SEA Directive requires information to be provided on:

- (a) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan;*
- (b) The environmental characteristics of areas likely to be significantly affected;*
- (c) Any existing environmental problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC [the 'Birds Directive'] and 92/43/EEC (the 'Habitats Directive').*

- 5.1. As part of undertaking a SA incorporating the requirements of the SEA Directive, the requirement for baseline information has been extended from just addressing the environmental baseline, to also include the relevant aspects of the social and economic current state, characteristics and problems relevant to the NRP Development Brief SPD.
- 5.2. As noted in the Scoping Report, the sustainability context for NRP draws heavily on baseline information presented in the LDF SA Scoping Report. Additional information relevant to NRP is also presented, providing a site specific characterisation.

SUSTAINABILITY ISSUES

- 5.3. Collation of existing environmental and sustainability data has helped to identify the sustainability issues that are facing the local area (set out in the following paragraphs), and therefore helps to establish the sustainability context for the appraisal of the Draft NRP Development Brief SPD. The data for NRP is discussed below under the headings of the first three of the five guiding principles of the UK Sustainable Development Strategy:
 - Living within environmental limits.
 - Ensuring a strong, healthy and just society.
 - Achieving a sustainable economy.
- 5.4. It is recognised however that many of the issues are cross-cutting and do not fit neatly into just one of the topics. The aim is not to present all issues relevant to the character of NRP, but to draw out those that are particularly significant and relevant to the NRP Development Brief SPD.
- 5.5. The likely implications for the SPD is set out in relation to the key sustainability issues identified in a table at the end of each section.

CHARACTERISATION OF SOUTH NORFOLK

- 5.6. The LDF SA Scoping Report characterises South Norfolk by presenting information on its population, ethnic profile, health and education, crime, employment, deprivation, housing, geographic setting, biodiversity, landscapes, built heritage, climate change and pollution, and reducing the risks from flooding. Information was then tabulated on each sustainability issue, describing the issue and the implications of that issue for the LDF. This baseline information is presented in **Appendix 4**.

South Norfolk Council: Key problems and issues

- 5.7. The key issues for South Norfolk that are relevant to the draft NRP Development Brief SPD, as identified in the LDF SA Scoping Report, are summarised in **Table 5.1** below, along with their implications for the Draft NRP Development Brief SPD.

Table 5.1 Key issues and problems for South Norfolk

Key issue	Likely evolution without the SPD/potential implications for the SPD
Living with environmental limits	
Protect sites of nature and natural conservation interest	Habitat and species loss and degradation associated with agricultural and land management practices could continue at NRP
Facilitate the healthy retention and growth of habitat sites at a time of increasing pressure	Absence of development at NRP could facilitate the retention of habitat sites. At the same time, sensitive landscaping and location of development at NRP could create additional habitat sites
Location of new development will need to consider genuine potential for more sustainable transport improvements in order to reduce contributions to climate change	Development at NRP is likely to improve sustainable transport provision
Reduce the effects of traffic on the environment	Traffic generation is likely to increase as an issue in the local area as population increases
Ensure maximum potential for use of public transport	Development at NRP is likely to improve sustainable transport provision
Minimise risks to development from the effects of climate change	Reducing the vulnerability of development to climate change is likely to continue as an issue in the local and wider area
Promote the installation of renewable energy solutions	The need for the use of renewable energy solutions is likely to continue as an issue in the local area
Avoid the use of currently undeveloped land if at all possible and maximise use of brownfield land. There is currently a very limited supply of brownfield land in South Norfolk.	Absence of development at NRP will conserve existing undeveloped land and maintain existing land use as agricultural. However, pressure from population growth could increase demand on this currently undeveloped land
Ensure development retains landscape character	Absence of development is likely to maintain the existing quality of the landscape at NRP.

Key issue	Likely evolution without the SPD/potential implications for the SPD
	However, population growth could increase pressure on landscapes
Protect cultural heritage and consider the implications of new development on the historic nature of the district	The historic environment at Colney Hall is likely to remain as it is in the absence of the SPD
Provide for sustainable use and sources of water supply	There is already a water supply issue in South Norfolk
Promote the sustainable use of natural resources and sustainable disposal of waste	Whilst the absence of development at NRP will conserve existing natural resources, other pressures from population growth could increase demand on natural resources. The production of waste is likely to increase with or without the implementation of the SPD, through pressures of population growth
Ensuring a strong, health and just society	
Support a range of employment types across the whole District	Likely to improve with the implementation of the SPD, through the generation of research and development employment opportunities
Encourage local job opportunities and vocational training resources	The development of allocated sites at NRP is likely to encourage local job opportunities
Facilitate healthy lifestyles through open space provision and walking and cycling	Likely to improve with the implementation of the SPD, through the encouragement of sustainable forms of transport and sensitive landscaping
Support the retention of local facilities	Likely to improve with the implementation of the SPD, providing an additional market for local facilities
Emphasise good design in the built environment	Likely to improve with the implementation of the SPD, through the use of sustainable design principles
Improve access to quality open spaces	Likely to improve with the implementation of the SPD through sensitive landscaping between buildings and providing links to local footpaths and open spaces
Achieving a sustainable economy	
Ensure adequate employment land resources remain available for existing businesses and attracting new enterprise	Developing allocated land at NRP is likely to provide additional space for existing businesses and attract new enterprise
Recognise the importance of emerging industries and improve prospects for new business start-ups	Likely to improve with the implementation of the SPD
Encourage sustained economic growth	Likely to improve with the implementation of the SPD, through the provision of inward investment, employment opportunities and training opportunities

CHARACTERISATION OF NRP

- 5.8. Whilst the baseline information presented as part of the LDF SA Scoping Report provides the context for draft NRP Development Brief SPD, site specific information is also presented to help appraise the effects of the SPD. Following a summary of the context to NRP, the baseline information at the site level is discussed below under the headings of the first three of the five guiding principles of the UK Sustainable Development Strategy.

Context

- 5.9. NRP is located on the urban fringe of Norwich city and lies immediately outside the city boundary on the south-west side of the River Yare opposite the University of East Anglia campus. There are two components which make up NRP. These are presented in **Figure 1.1** and consist of:

1. The existing series of developments; and
2. Areas allocated for research and development uses as part of the South Norfolk Local Plan.

Existing development

- 5.10. Existing development east of the Yare consists primarily of the John Innes Centre (JIC), Food Research Institute (FRI) and the Norwich and Norfolk University Hospital (NNUH). These developments occupy land to the east of areas zoned for the extension of the NRP.
- 5.11. The JIC is characterised by reasonably high density single to 3-4 storey buildings in a range of styles and ages. The buildings that constitute the FRI have a more integrated expression and are set at lower density in landscaped grounds to the north of the JIC. The Triangle site to the north is currently undeveloped but has road access and is ready for development to proceed. The NNUH is by far the biggest component both in site area and floor space and consists of a single design central spine of buildings with orbital access road and extensive perimeter parking.
- 5.12. The organisations that currently constitute NRP include:
- University of East Anglia (UEA), including the School of Nursing and Midwifery
 - Norfolk and Norwich University Hospital (including a Crèche, GP and 'Big C' facilities)
 - John Innes Centre
 - Institute of Food Research
 - Sainsbury Laboratory
 - A range of companies working out of NRP¹²

¹² The range of companies working out of NRP are listed in **Appendix I**.

- 5.13. Strengthening access, resource and infrastructure links between NRP constituents will provide integration and continued success, achieving sustained growth as a partnership.

Areas allocated as part of the South Norfolk Local Plan

- 5.14. The newly allocated areas for expansion are set out in **Figure 2.1**. They comprise:
- Colney Hall (15ha) (COL1)
 - Land east of John Innes Centre (COL1)
 - Land east of Hethersett Lane and south of the Watton Road (COL2)
 - Land zoned for hospital expansion east of the Norfolk and Norwich University Hospital (5ha) (COL4)
- 5.15. The Draft NRP Development Brief SPD provides a framework for development for these allocated areas for expansion. The last three allocations are adjacent to each other and are referred to as the *main site* throughout the characterisation. The Colney Hall component is referred to as the *Colney Hall site*.

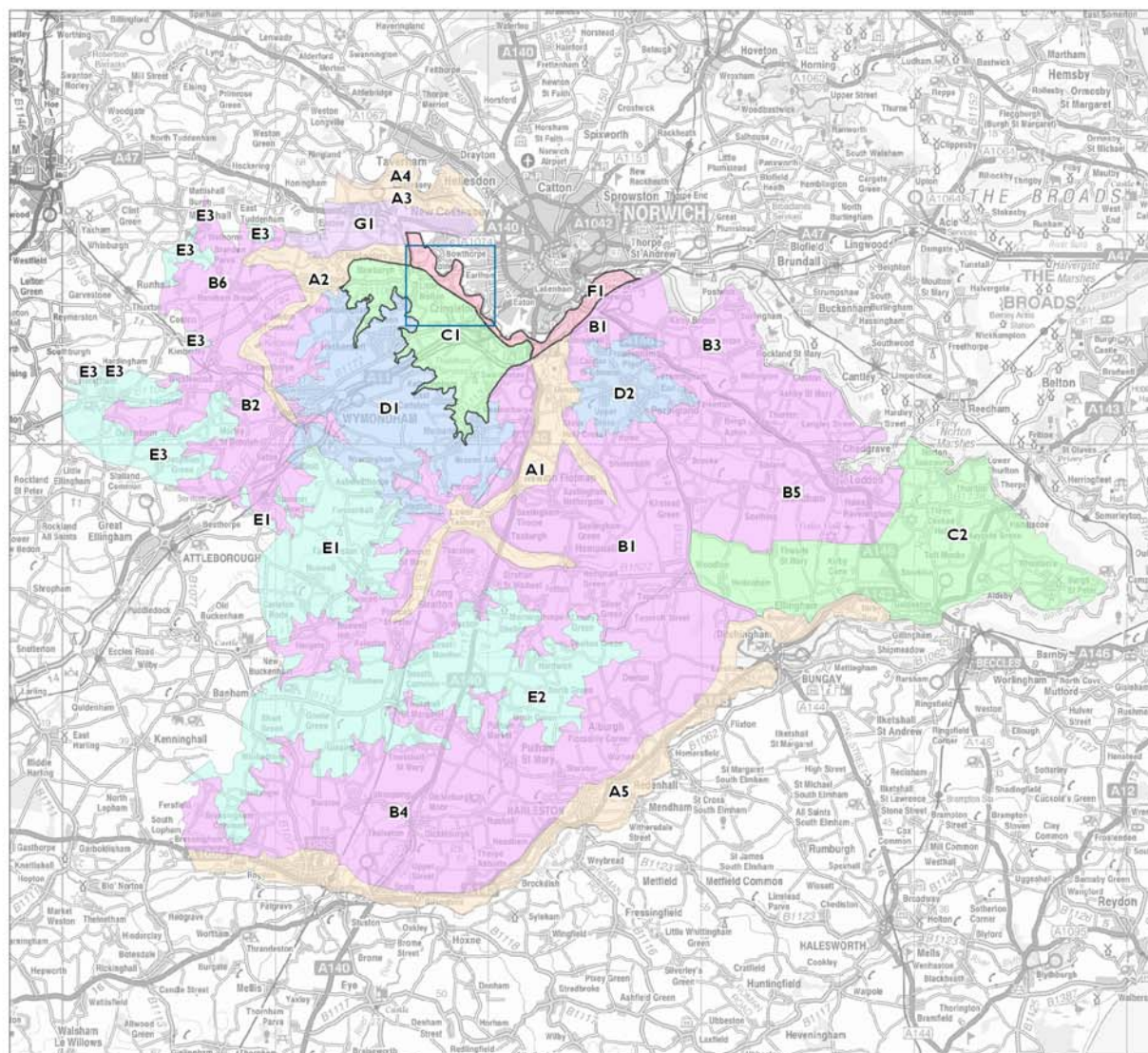
Living within environmental limits

Landscape

- 5.16. The allocations for the expansion of NRP are primarily on greenfield land.
- 5.17. The South Norfolk landscape has been described as one of subtle contrasts and restrained beauty with landscapes ranging from the exhilarating openness of the farmed plateaux to the peaceful rural quality of the valleys. A Landscape Character Assessment for South Norfolk was carried out in 2001, and is currently being updated by LUC. This Assessment identifies Landscape Types (which are generic and share common combinations of geology, topography, vegetation and human influences) and Character Areas (which are single and unique, discrete geographical areas of a landscape type).
- 5.18. According to the Landscape Character Assessment, NRP falls within two Character Areas within two different Landscape Types. These are shown in **Figure 5.1** and are described below:

Yare Valley Urban Fringe Character Area, within the Valley Urban Fringe Landscape Type: this accounts for a small part of the north of NRP. The area is significant in that it provides an open and distinctive boundary with the City boundary. Its particular characteristics are its valley form, which is relatively unusual for South Norfolk, and its woodland and waterways (although no waterways are within the NRP area).

Yare Tributary Farmland with Parkland, within the Tributary Farmland with Parkland: the bulk of the NRP allocation is covered by this character area which is characterised by arable landscapes, intermittent long views to the city of Norwich and a gently undulating topography.



Norwich Research Park Development Brief SPD SA/SEA

Figure 5.1: Landscape

Key

- CI: Yare Tributary Farmland with Parkland
- FI: Yare Valley Urban Fringe

Landscape Character Areas

- A: Rural River Valleys
- B: Tributary Farmland
- C: Tributary Farmland with Parkland
- D: Settled Plateau Farmland
- E: Plateau Farmland
- F: Valley Urban Fringe
- G: Fringe Farmland
- Development Area



Date: 11/01/2007

Revision



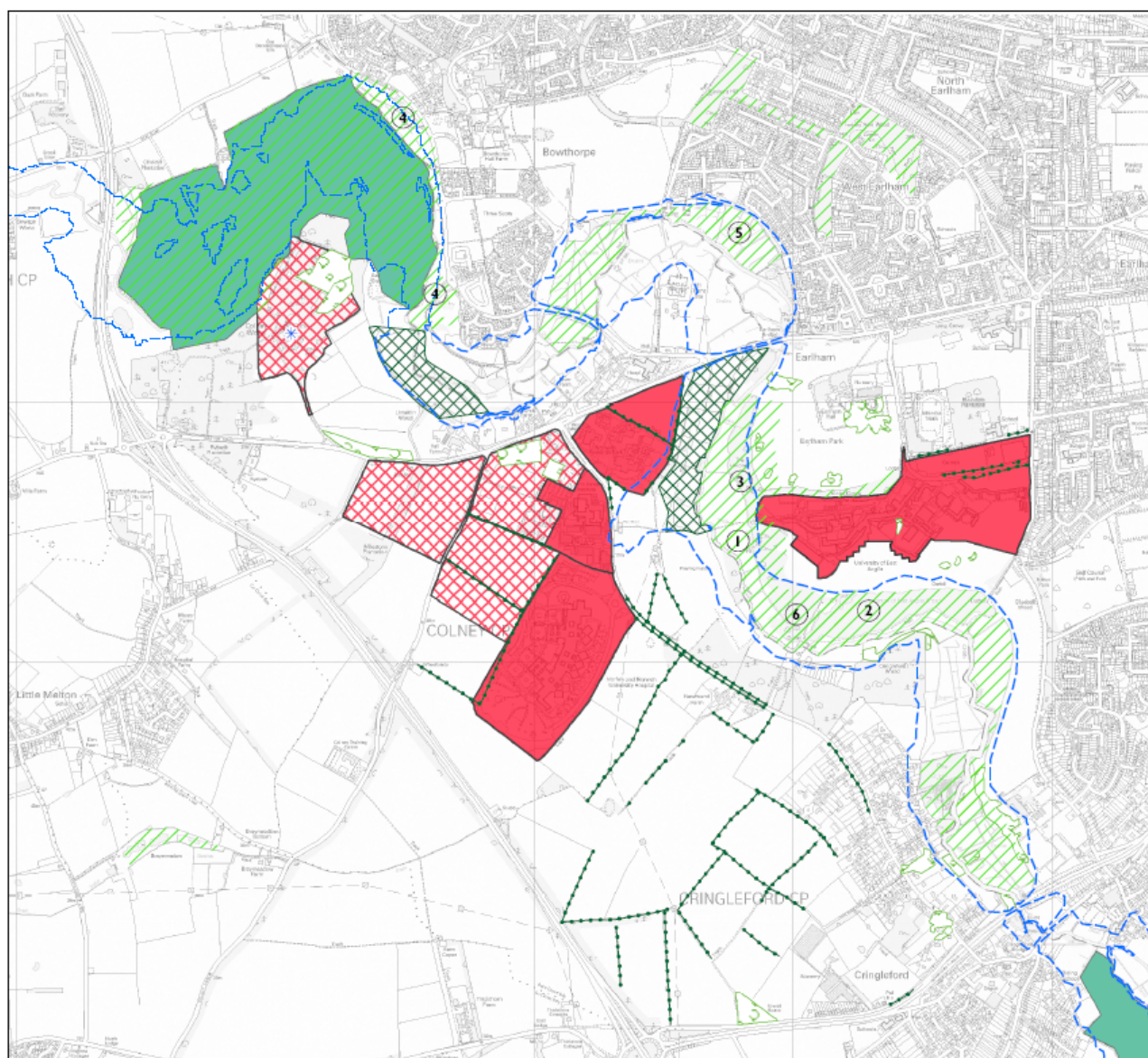
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Landscape Character

- 5.19. The main site in particular is characterised by its open nature with broad views and relatively little sense of enclosure. This is exacerbated by the open gently rolling topography, relatively large fields and an absence of significant hedgerows. Its character is essentially agricultural although there is awareness of adjacent development – the NNUH and JIC visually, and the A47 and to a lesser extent the Watton Road, acoustically. Despite its urban fringe location, the site has a quiet integrity and is under arable crops.
- 5.20. Colney Hall has a more complex character stemming from a combination of more varied terrain and woodland cover providing a more intimate landscape, although the Hall and its immediate environs enjoy a fine south-easterly prospect.

Landscape structure

- 5.21. The principal structural elements in the NRP area are the shelter belts and, to a lesser extent, the hedgerows of the main site; and the woodland of Colney Hall. These elements have greater significance because of the openness of the landscape. **Figure 5.2** presents the locations of scattered trees and significant hedgerows.
- 5.22. The shelter belts are generally dense mixed woodland of a single age. Milestone Plantation running north-south through the main site is the principal element. However there is a further network of belts planted adjacent to the A47 and to the west of Milestone Plantation. Although recently planted, these belts will have increasing significance in the landscape as they mature. These shelter belts are the result of efforts to mitigate the strong winds of the area. Prevailing winds are as usual from the south-west but the winter northerly and easterly winds have a particular ‘bite’ given the sea’s proximity.
- 5.23. Elsewhere in the main site, specimen mature oaks with or without hedgerows provide a secondary structure giving a strong and distinctive ‘countryside’ character. A belt of poplars towards the north end of Hethersett Lane is significant but because of their species have lower value and shorter expected lifespan.
- 5.24. These elements have the effect of dividing the main site into a major portion east of Milestone Plantation with a sub area to the rear of the JIC; and a smaller area west of Milestone Plantation hemmed in between recently planted belts.
- 5.25. At Colney Hall woodland forms the principal landscape structure providing a dense envelope to the north and east half of the site. The quality of this woodland is variable with the plantation area at the centre being of significantly lower value. The western part of the site is characterised by the remnants of the Hall’s designed landscape and includes a number of significant specimen trees, exotics and strategically placed tree groups.
- 5.26. Broadly speaking this divides Colney Hall into two landscape areas – those more open areas closer to the Hall; and areas of dense woodland to the north and east.



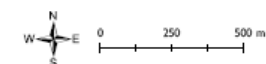
Norwich Research Park Development Brief SPD SA/SEA

Figure 5.2: Landscape Structure Key

- Existing development and sites with planning permission
- Allocated sites for research & development uses
- Significant hedgerow
- Meadow grazing
- Scattered trees
- River floodplain
- Policy ENV13: Sites of regional and local nature conservation interest and geologic/geomorphologic value
- County Wildlife sites

- 1 UEA Marsh
- 2 UEA Broad
- 3 The Heronry and Violet Grove
- 4 Bowthorpe Riverside
- 5 Earham Marsh
- 6 UEA Butterfly Meadow

Colney Hall has existing D1 (Non-residential institutions) and B1(a) (offices) uses. There are also existing D1 and B1 consents in place at Colney Hall



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Topography, soils and drainage

- 5.27. With the exception of Colney Hall, all other areas have gentle gradients generally towards the north-east and the River Yare with none of the slopes posing issues for built development. By contrast the Colney Hall site is located on a south-east facing ridge with a relatively steep scarp slope descending to the Yare. Development on this scarp would need to carefully consider the nature of the gradient prior to any to any proposals.
- 5.28. Soils are generally light and free draining. Consequently there are few ditches or water courses.

River Valley and flooding

- 5.29. As illustrated in **Figure 5.2**, NRP is located within the Yare Valley and so is located close to the river floodplain. However, none of the existing developments or allocated sites are within flood risk areas according to the South Norfolk Local Plan. However, surface run-off is expected to increase from development of the allocated sites, owing to the change in use from free draining fields to buildings and hardstandings.

Sites of nature conservation

- 5.30. There are nine species featured in the Norfolk Biodiversity Action Plan which have been identified in the local area by the Norfolk Biological Records Centre (NRBC). These species require consideration in plans. They include:
- Barn Owl
 - Common Frog
 - Common Toad
 - Grass Snake
 - Otter
 - Pipistrelle
 - Red Squirrel
 - Smooth Newt
 - Water Vole
- 5.31. Whilst there are no designated habitats of national or European importance that are in close proximity to NRP, the area includes a range of habitats that are important to the local area. These are mapped in **Figure 5.2** and include:
- Locally-significant County Wildlife Sites (including Earlham Marsh, Heronry and Violet Grove, UEA Marsh, UEA Broad, UEA Butterfly Meadow, and Bowthorpe Riverside). Information on these sites (where it is available) is provided in **Appendix 4**.

- Sites of regional and local nature conservation interest and geologic/geomorphologic value: there is one of these sites which borders Colney Hall and extends across the river floodplain.
 - Meadow grazing which borders sections of the River Yare.
 - Scattered trees and plantations. Owing to the density of the plantation, there is a relatively poorly developed ground flora, but is still expected to be important for bird life.
 - Significant hedgerows, which provide connectivity between habitats.
- 5.32. Consultation responses on the SA Scoping Report identified potential effects on sensitive bird and bat populations in the event of tree or hedge belt removal.

Heritage

- 5.33. Colney Hall is a Grade II listed building set within the remnant of a historic landscape, although the latter is not on the English Heritage Register of Parks and Gardens. Some of the parkland trees and exotics in the Hall's vicinity have additional heritage value. The walled garden and remains of ornamental rockwork east of the Hall have heritage value with parts of the former predating the current Hall.
- 5.34. The most significant historic element is, in many ways, the south-easterly prospect from the Hall.
- 5.35. There are no known elements of heritage value in the main site.

Water consumption and water resources

- 5.36. Discussions with Anglian Water have highlighted that the current water supply network in the area around NRP has reached capacity. The Norfolk and Norwich University Hospital has established a priority which identifies the mains water supply to Colney as a back-up should the primary supply and storage become compromised. Should a borehole be considered at NRP for water supply, the filtration of high-levels of nitrate in the ground water is expected to be a key issue.

Living within environmental limits: key problems and issues

- 5.37. The key problems and issues in NRP associated with living within environment limits are summarised in **Table 5.2**, along with their implications for the Draft NRP Development Brief SPD.

Table 5.2 Key issues and problems for living within environmental limits in NRP

Key issue	Likely evolution without the SPD/potential implications for the SPD
Development pressure on the open landscape and intermittent long views.	Whilst pressures on the landscape and long views are not likely to occur at NRP, they are likely to continue in the wider area as a result of other development.

Key issue	Likely evolution without the SPD/potential implications for the SPD
Development pressure on landscape components including shelter belts, woodland, hedgerows and trees	Whilst pressures on landscape components are not likely to occur at NRP, they are likely to continue in the wider area as a result of other development.
Increased surface run-off and potential effects on the water quality of surrounding water bodies.	Surface run-off likely to increase as a result of development in the area. However, unlikely to increase at NRP without the SPD.
Habitat degradation and species disturbance	Habitat and species loss and degradation associated with agricultural and land management practices as well as development likely to continue.
Need to protect and enhance built heritage and its setting	The need to protect the built heritage is likely to continue.
High levels of water consumption	Likely to continue in the absence of policies to reduce water consumption.

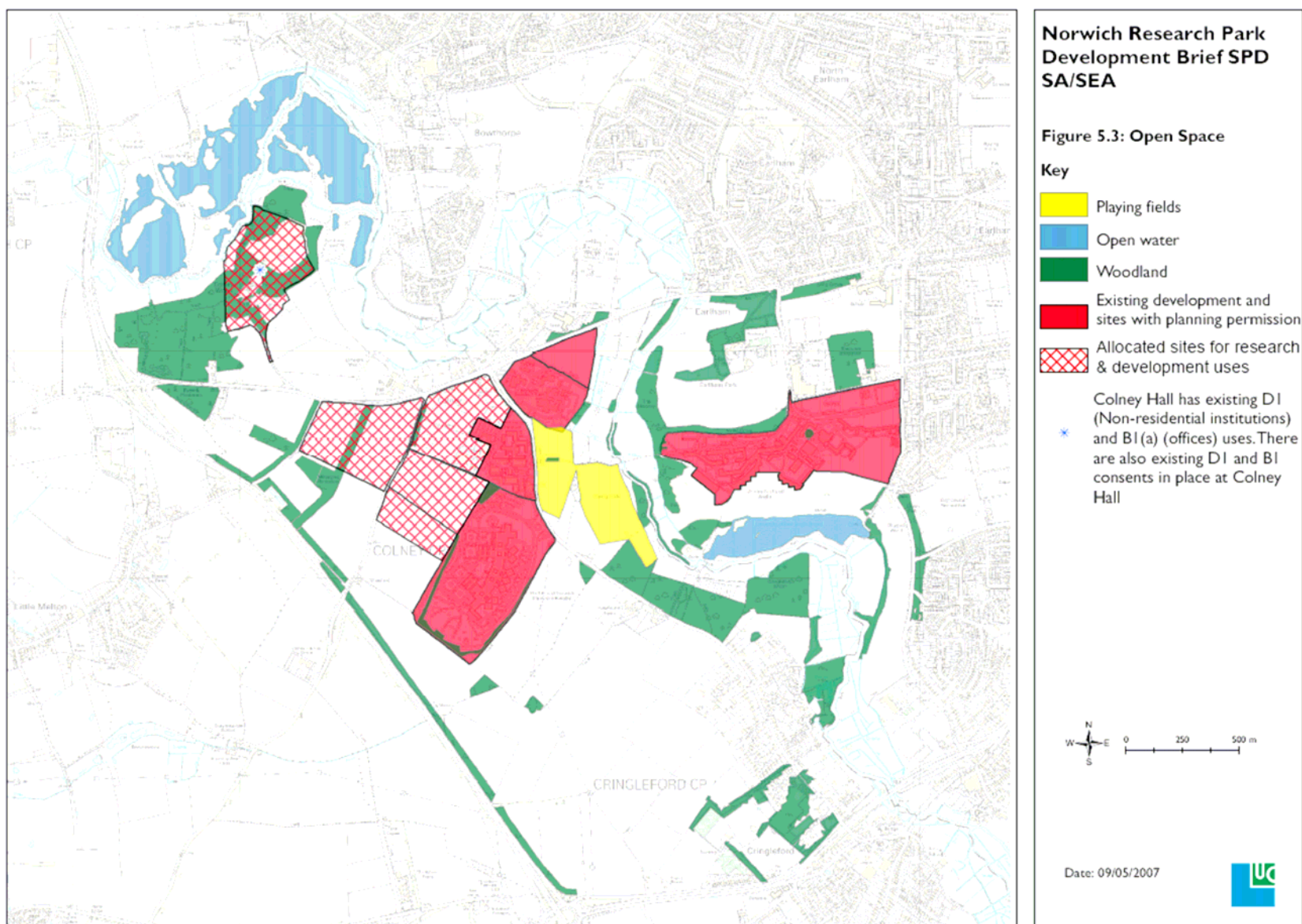
Ensuring a strong, healthy and just society

Access to recreational facilities and open space

- 5.38. Although there is a general lack of open space for recreational needs within the NRP area, the site is located next to Earlham Park and the UEA playing fields, both with public access. These areas of open space in addition to areas of open water and woodland are presented in **Figure 5.3**. These areas are important for quality of life and health of the surrounding population.

Access

- 5.39. The sites are accessed principally by the Watton Road and its side roads, Hethersett Lane and Colney Lane. There is no direct access from the A47 bypass. Colney Hall is accessed by a private drive from the Watton Road. The Watton Road is characterised by relatively high traffic volumes particularly at peak times when it is close to capacity. Eastern parts of this road have been improved with signalised junctions and have an urban character. The western part is a relatively unimproved lane with adjacent hedgerows. There are plans to undertake minor safety-related improvements to this section.
- 5.40. Hethersett Lane is an unimproved lane and suffers from excess vehicle speeds and a 'difficult' junction with the Watton Road. Colney Lane has been upgraded as far as the NNUH entrance. A recently constructed road provides access to the Cringleford roundabout on the A47.



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- 5.41. There is an existing road between the main UEA campus and the existing Colney Lane research institutes, which is currently voluntarily restricted in use to specific vehicles during off-peak hours. There is also a permissive pedestrian and cycle route between the campus and Colney Lane, which continues to NNUH and the UEA School of Nursing and Midwifery. There is currently no direct public transport route between Colney Lane and the main UEA campus, although a bus service is available via Colney Lane, the Watton Road and Earlham.

Traffic volumes

- 5.42. Whilst there is potential that additional traffic could be generated from the existing allocations and extensions offered through the SPD, there is potential for the SPD to minimise traffic generation and alleviate current traffic volume issues in the area.
- 5.43. Transport, access and infrastructure provision are all possible arrangements that might feature as part of securing developer funding through the NRP expansion.

Ensuring a strong, healthy and just society: key problems and issues

- 5.44. The key problems and issues in NRP associated with ensuring a strong, healthy and just society are summarised in **Table 5.3**, along with their implications for the Draft NRP Development Brief SPD.

Table 5.3 Key issues and problems for ensuring a strong, healthy and just society in NRP

Key issue	Likely evolution without the SPD/potential implications for the SPD
Lack of open space for recreational needs.	Likely to continue without the SPD, although this does depend on the landscaping schemes adopted as part of associated development proposals.
High traffic volumes around NRP, specifically on the Watton Road.	Additional traffic could be generated from the existing allocations and extensions offered through the SPD. However, the SPD offers opportunity to minimise traffic generation and alleviate current traffic issues in the area.
Discontinuity of cycle paths.	Likely to be addressed by the SPD, although this largely depends on the approach taken to sustainable forms of transport in the SPD.
Provision of adequate linkages and sustainable access arrangements within the NRP	Likely to improve with the implementation of the SPD

Achieving a sustainable economy

Role of NRP in local economy

- 5.45. NRP plays a significant role in the South Norfolk and greater Norwich economy. For example, the Norfolk and Norwich University Hospital directly employs 5,400 people

and indirectly supports 1,000 jobs, while the UEA School of Nursing and Midwifery has over 150 staff. The NRP has been established since the 1960s, growing into East Anglia's third largest employer with over 5000 staff. Together with the UEA, the NRP now jointly represents one of the largest concentrations in Western Europe of such biotechnical expertise.

- 5.46. Any expansion to the site is likely to increase the number of jobs available and enhance the status of the area as a business and research centre. The importance of the NRP to the region as a whole is acknowledged within the draft Regional Spatial Strategy, being classified as a 'strategic employment site' in draft policy NSR1 and E4, requiring land for expansion to be reserved 'to support its role in biotechnology'.

Employment

- 5.47. In the south of the District, most of the land is used for agriculture and food related industry, giving this sector great influence despite employing only 15% of the workforce. Whilst unemployment in the district is low (2.9%) compared to the national average (4.5%), adult earnings are only 85% of the national average earnings, showing the reliance of the district on retail and manufacturing sectors.

Inward investment

- 5.48. Whilst there is a general lack of local information on inward investment in NRP, it is clear that the research park plays a key role in promoting investment in South Norfolk. For example, the district has one of the fastest growing economies in the UK, which is largely building on its strengths in science and technology, healthcare, engineering and food science, principally from the research park at Colney and its linkages with the UEA and NNUH. Any expansion of NRP will offer opportunities for international investment, local inward investment and also inspire 'home-grown' business start-ups. In doing so, these will help diversify the district economy.

Achieving a sustainable economy: key problems and issues

- 5.49. The key problems and issues in NRP associated with achieving a sustainable economy are summarised in **Table 5.4**, along with their implications for the Draft NRP Development Brief SPD.

Table 5.4 Key issues and problems for achieving a sustainable economy

Key issue	Likely evolution without the SPD/potential implications for the SPD
Employment reliant on a few economic sectors.	The SPD is likely to diversify the economic and employment base.
NRP has a key role in inward investment in South Norfolk.	The SPD is likely to further promote inward investment in South Norfolk.

6. SUSTAINABILITY APPRAISAL FRAMEWORK

DEVELOPMENT OF SA OBJECTIVES

- 6.1. Development of an SA Framework provides a recognised way in which the sustainability effects of a plan can be described, analysed and compared. The SA Framework consists of a set of sustainability objectives which state desired outcomes¹³, accompanied by relevant targets (where these exist) and indicators to measure progress towards the objectives and/or target. SA objectives are distinct from the objectives of the Draft NRP Development Brief SPD (although there may be some overlap).
- 6.2. The sustainability performance of the NRP Development Brief SPD has been appraised against the SA Framework. To maximise consistency between the appraisal process of the South Norfolk LDF and the Draft NRP Development Brief SPD it was decided, following a review of the SA Framework for the SA of the South Norfolk LDF, that the same SA Framework should be applied in the SA of the Draft NRP Development Brief SPD. **Figure 6.1** describes how the SA Framework for the SA of the South Norfolk LDF was devised.
- 6.3. The SA Framework for the NRP Development Brief SPD is set out in **Table 6.1**. **Appendix 5** sets out the SA Framework in detail, including its objectives, sub-objectives and related indicators.

Figure 6.1 Devising the SA Framework¹⁴

The ODPM SA Guidance (November 2005) states that SA objectives should address the full cross-section of sustainability issues laid down by law or policy or in other plans and programmes and others devised specifically in relation to the context of the plan being prepared. This approach was applied in deriving the SA Framework for the SA of the South Norfolk LDF as the objectives were formulated after consideration of the sources reviewed under Stage A1 of the SA process (section 5.1).

The SA Scoping Report for the South Norfolk LDF sets out a series of 22 SA objectives, including 9 environmental, 8 social, and 5 economic objectives. Investigative questions are listed against each SA objective, to help identify the effects that policies, options or allocation of the South Norfolk LDF will have. It is noted in the Scoping Report of the SA of the South Norfolk LDF that these questions do not necessarily require individual answers and commentary, but rather seek to prompt lines of inquiry.

¹³ According to the ODPM SA Guidance, SA objectives should focus on outcomes (e.g. improved biodiversity), rather than the means of achieving it (e.g. protection of specific wildlife sites).

¹⁴ Adapted from **South Norfolk District Council Local Development Framework (Draft)**. South Norfolk Council, December 2005.

Table 6.1 NRP Development Brief SPD Sustainability Appraisal Framework

SA Objective		Question/decision-making criteria
Environment		
ENV1	To maintain and enhance biodiversity, geodiversity, species and habitat quality, and avoid habitat fragmentation	Will it protect sites of nature conservation value from inappropriate development?
		Will it increase the number or diversity of sites of nature conservation interest?
		Will it bring negative effects to designated sites and what would this involve?
		Will it adversely affect sites of geological interest?
		Will it contribute to achieving BAP targets?
ENV2	To reduce vulnerability to climate change, including minimising the risks from flooding	Will it adversely affect sites of geological interest?
		Will it contribute to achieving BAP targets?
ENV3	To maximise the use of renewable energy solutions and reduce contributions to climate change	Will it contribute to achieving BAP targets?
		Will it encourage efficient use of energy?
		Is it promoting a sequential approach to the pattern of development?
		Will it reduce the emissions of greenhouse gases, including from traffic?
ENV4	To reduce the effect of traffic on the environment	Will it reduce traffic volumes?
		Will it reduce traffic congestion?
		Will it reduce the effect of HGV traffic on people and the environment?
		Will it increase the % of journeys using non-car modes?
ENV5	To improve air quality and minimise noise, vibration and light pollution	Will it reduce emissions of atmospheric pollution?
		Can it improve the ambiance of local areas?
ENV6	To maintain and enhance the distinctiveness and quality of landscapes, townscapes and the historic environment	Will it protect vulnerable and valued landscapes, or mitigate the effects of inappropriate development?
		Will it ensure that design is complementary to, or able to enhance, the character of local landscapes?
		Will it reduce the amount of derelict, degraded and under-used land?
		Will the District's heritage be preserved or enhanced?
ENV7	To minimise the loss of undeveloped land and conserve and improve the quality of soil resources	Will it avoid the use of productive agricultural land?
		Will it minimise the irreversible use of soil resources?
ENV8	To improve water qualities and provide for sustainable	Does it incorporate Sustainable Urban Drainage Systems?

SA Objective		Question/decision-making criteria
	sources of supply and sustainable use	Will it reduce water consumption?
		Will the supply of water be efficient in terms of the overall network?
ENV9	To minimise the production of waste and increase recycling?	Will it result in less waste being produced or requiring disposal?
		Will it facilitate better community recycling facilities?
Social		
S1	To provide everybody with the opportunity to live in a decent, suitable and affordable home	Will it reduce homelessness?
		Will it increase the range and affordability and quality of housing stock for all social groups
S2	To reduce poverty, inequality and social exclusion	Will it reduce poverty and social exclusion in those areas most affected?
S3	To offer opportunities for all sections of the population to have rewarding and satisfying employment	Will it reduce unemployment overall?
		Will it improve earnings?
S4	To improve accessibility to essential services, facilities and the workplace, particularly for those most in need	Will it improve accessibility to key local services?
S5	To improve the education and skills of the population overall	Will it improve qualifications and skills of young people?
S6	To improve the health of the population overall	Will it reduce death rates?
		Will it improve access to high quality health facilities?
		Will it encourage healthy lifestyles?
S7	To encouraging local community identity and foster mixed communities with co-operative attitudes, helping to reduce anti-social activity.	Will it reduce actual levels of crime/fear of crime?
		Will it encourage engagement in community activities?
S8	To improve the quality of where people live	Will it improve satisfaction of people with their neighbourhoods?
		Will it increase access to and provision of quality open space?
Economic		
EC1	To encourage sustained economic growth	Will it support emerging employment uses in the District (e.g. Research, tourism)?

SA Objective		Question/decision-making criteria
		Will it help retain existing businesses?
		Will it aid farming diversification?
EC2	To encourage and accommodate both indigenous and inward investment promoting a positive image of the District.	Will it provide for a variety of locations for businesses?
		Will it add to a ready supply of employment premises?
		Is it supporting targeted emerging employment types?
EC3	To encourage efficient patterns of movement in support of economic growth	Will it encourage the development of local employment locations?
		Is it located so as to minimise the journey to work?
		Will it enhance a group of existing employment generating uses?
		Will it encourage mixed use or live / work?
EC4	To improve the social and environmental performance of the economy	Will it offer the opportunity for more flexible working?
		Will it operate in a way which seeks to minimise impact on the environment?
EC5	To improve the economic performance in rural areas	Will it encourage rural diversification?
		Will it offer sources of employment in rural areas?
		Will it improve electronic communication potential?

COVERAGE OF SEA TOPICS

- 6.4. Annex I(f) of the SEA Directive requires that information is provided on the likely significant effects on a number of environmental topics. **Table 6.2** sets out the 'SEA topics' and shows that they are all covered by at least one of the draft SA objectives. Coverage of the SEA topics by the SA objectives ensures that each of the topics will be addressed in the sustainability appraisal of the Draft NRP Development Brief SPD. (Adapted from Table 4.3 of the Scoping Report of South Norfolk LDF).

Table 6.2 Coverage of SEA topics by the SA objectives

SEA topic	Covered by SA Objectives
Biodiversity	ENV1
Population	S1, S2, S3, S4, S5, S6, S7
Human Health	S1, S2, S3, S4, S5, S6
Fauna	ENV1
Flora	ENV1
Soil	ENV7
Water	ENV8
Air	ENV5

SEA topic	Covered by SA Objectives
Climatic Factors	ENV2, ENV3,
Material Assets ¹⁵	ENV7, ENV8, ENV9, S8, E1, E2, E3, E4, E5
Cultural Heritage	ENV4, ENV5
Landscape	ENV6

¹⁵ Material assets are considered to include physical infrastructure, settlement pattern, and efficient use of land and resources.

7. APPRAISAL OF THE NRP DEVELOPMENT BRIEF SPD

INTRODUCTION

- 7.1. The options for the NRP Development Brief SPD and the document itself were appraised against the SA objectives in the SA Framework as set out in **Chapter 6**. The SPD options and components that were appraised as part of this SA include:
- Broad options which focus on alternative plot ratios for development within NRP and transport strategies that are used to access the site.
 - Detailed options which explore alternative ways of expressing the preferred broad option (in terms of broad layouts of development at NRP).
 - The Vision, Objectives and Design Principles of the preferred option which comprises the consultation draft Development Brief SPD (which this SA Report accompanies).
- 7.2. **Figure 7.1** describes each of these appraisal stages setting out what was appraised, how the results of the appraisals were used and how this fed into the preparation of the Development Brief. The remainder of this chapter briefly summarises how the SPD options and components were appraised and then sets out the main findings of the SA.

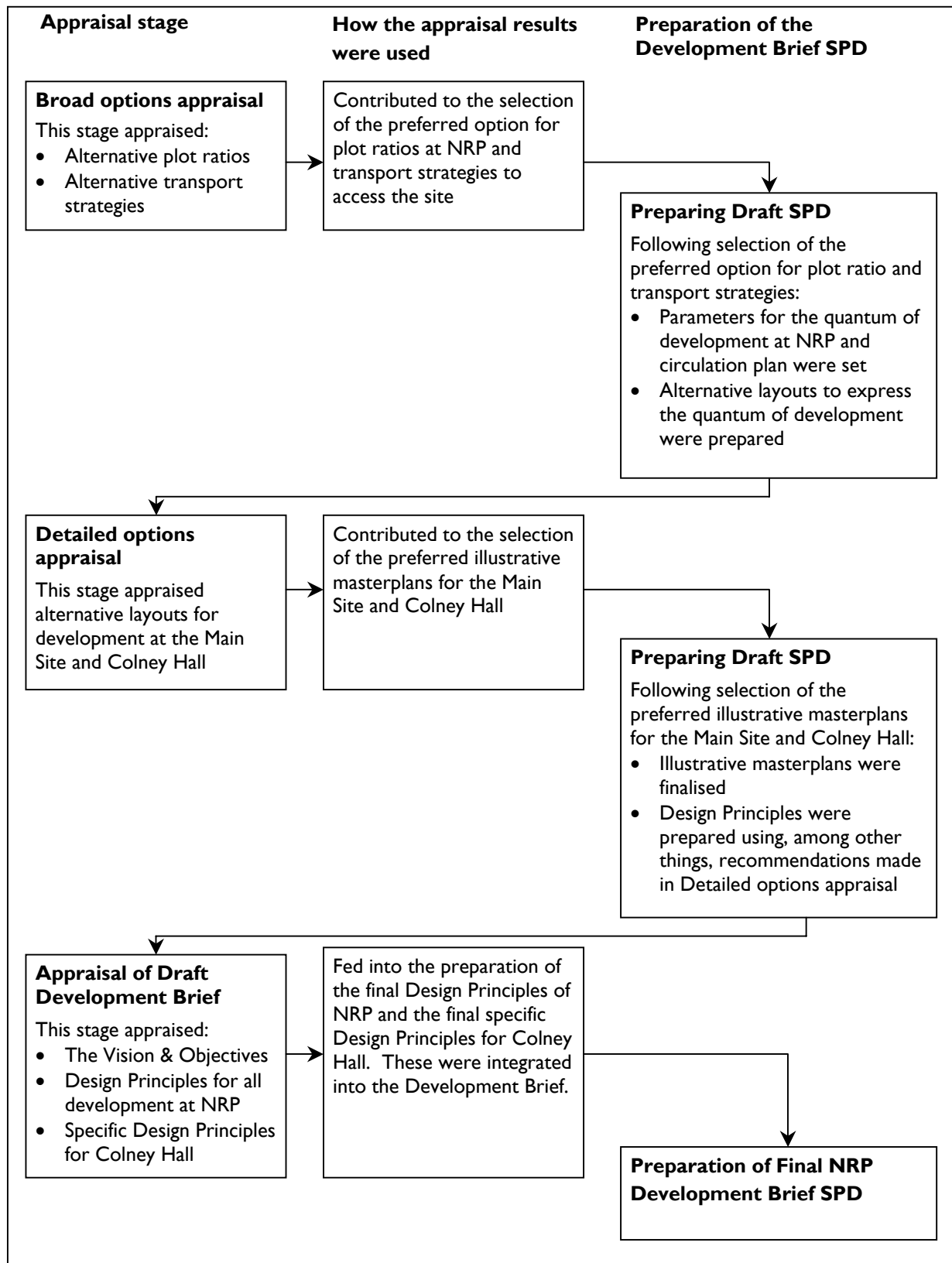
Method

- 7.3. Each of the options were appraised against each of the SA objectives listed in the SA Framework (see **Table 6.1**). For each assessment, a 'score' was determined reflecting the extent to which the option would be likely to work towards or work against the SA objective. To do this, the symbols in **Table 7.1** were used. For each assessment of effects against a SA objective, a description was given justifying the reasons for the score.

Table 7.1: Key to Sustainability Appraisal Symbols

Score	Description
++	Option likely to have a significant positive effect on the SA objective
+	Option likely to provide some support for the SA objective
0	Neutral impact/no relationship to the SA objective
-	Option could give rise to some minor conflict with the SA objective
--	Option likely to significantly conflict with the SA objective
/	Option could have a mixed effect (e.g. significant positive effects and significant negative effects would be ++/--)
?	Uncertain effects

Figure 7.1: The appraisal stages of the SA and how the results fed into the preparation of the Development Brief



- 7.4. In appraising the sets of options against the symbols in **Table 7.1**, it was often difficult to distinguish between the relative performance of individual options as they would often all have either significant or not significant effects against a given SA objective. Therefore, to capture the more subtle differences between individual options, they were also ranked according to their performance against the SA objective. The option performing best was ranked '1', the second best performing option was ranked '2', and so on. Where performance was similar between options, the same ranking was given.
- 7.5. The use of rankings was therefore only used to capture subtle differences between options. As a result, the option with the highest number of 'first' rankings would not necessarily be indicative of an overall better performance compared to other options.

BROAD OPTIONS

- 7.6. The broad options for the NRP Development Brief SPD focus on alternative plot ratios for development within NRP and alternative transport strategies to access new development at NRP. These are discussed below.

Plot ratios

- 7.7. Alternative plot ratios¹⁶ demonstrate different relationships between the gross floor area of buildings and the net area of the site that could be used to express development at NRP. Therefore, a plot ratio of 16% means that the overall floor area of buildings on the site (including each floor of buildings above and below ground) is 16% of the area of the site that could be used for development including space allocated for parking, loading and unloading commercial vehicles and public transport operational purposes.
- 7.8. A range of plot ratios were considered for development at NRP. These are summarised in **Table 7.2**.

Table 7.2: Plot ratios for development at NRP

Plot ratio	Rationale for selection of plot ratio
16%	Based on the figure observed for Cambridge Science Park
19%	Based on an average of the plot ratios observed at a number of research/science parks, including Cambridge Science Park, Oxford Science Park and Granta Park
24%	Target figure quoted in the 2004 Norfolk County Council Report to Task Force
35%	Considered to be an upper bound on what is achievable by 2021/2035

¹⁶ The definition of plot ratio that is being used for the purposes of the SA is the relationship between the gross floor area of buildings and the net area of a site. The gross floor area is defined as the overall floor space of the building on each level. However, any space allocated for parking, loading and unloading should be excluded from the gross floor area.

Transport strategies

- 7.9. Alternative transport strategies to access NRP were identified. They include a car-dependant access strategy, a public transport focussed access strategy, and a mixed public transport and car access strategy. The components which make up these transport strategies are set out in *Norwich Research Park Transport Assessment Part 1 – Development Trips* (Mott MacDonald on behalf of Norfolk County, July 2006) and are summarised in **Appendix 6**.

Identification of reasonable broad options

- 7.10. The range of possible options that could arise from alternative plot ratios and transport strategies for NRP are summarised in **Table 7.3**.

Table 7.3: Range of possible broad options that could be subject to sustainability appraisal

Plot ratio (%)	Transport strategy		
	Public transport focussed access	Mixed public transport and car access	Car dependant access
16	Possible option 1	Possible option 5	Possible option 9
19	Possible option 2	Possible option 6	Possible option 10
24	Possible option 3	Possible option 7	Possible option 11
35	Possible option 4	Possible option 8	Possible option 12

- 7.11. All 'reasonable' options from the range of possible broad options set out in **Table 7.3** need to be appraised against the SA Framework. **Table 7.4** sets out the justification for identifying which options are considered to be 'reasonable'. It identifies five options which are considered to be reasonable alternatives to achieve the objectives of the SPD. These are:

- Mixed public transport and car access strategy with development at 16% plot ratio (Possible option 5 in **Table 7.3**).
- Mixed public transport and car access strategy with development at 19% plot ratio (Possible option 6 in **Table 7.3**).
- Mixed public transport and car access strategy with development at 24% plot ratio (Possible option 7 in **Table 7.3**).
- Car-dependant access strategy with development at 16% plot ratio (Possible option 9 in **Table 7.3**).
- Car-dependant access strategy with development at 19% plot ratio (Possible option 10 in **Table 7.3**).

Table 7.4: Broad options considered to be reasonable/not reasonable

Plot ratio (%)	Possible option no.	Reasonable/not reasonable	Reason
Public transport focussed access strategy			
16	1	Not reasonable	No employee parking, which is likely to threaten the commercial viability of NRP
19	2	Not reasonable	No employee parking, which is likely to threaten the commercial viability of NRP
24	3	Not reasonable	No employee parking, which is likely to threaten the commercial viability of NRP
35	4	Not reasonable	No employee parking, which is likely to threaten the commercial viability of NRP
Mixed public transport and car access strategy			
16	5	Reasonable	Transport strategy and plot ratio is likely to reasonably achieve the objectives of the SPD
19	6	Reasonable	Transport strategy and plot ratio is likely to reasonably achieve the objectives of the SPD
24	7	Reasonable	Transport strategy and plot ratio is likely to reasonably achieve the objectives of the SPD
35	8	Not reasonable	Levels of extra trips generated on current junctions and roads is not expected to be sustained due to the capacity threshold being exceeded
Car dependant access strategy			
16	9	Reasonable	Transport strategy and plot ratio is likely to reasonably achieve the objectives of the SPD
19	10	Reasonable	Transport strategy and plot ratio is likely to reasonably achieve the objectives of the SPD
24	11	Not reasonable	Option will conflict with policies in Norfolk County Council's Local Transport Plan. Levels of extra trips generated on current junctions and roads could not be sustained due to the capacity threshold being exceeded
35	12	Not reasonable	Option will conflict with policies in Norfolk County Council's Local Transport Plan. Levels of extra trips generated on current junctions and roads could not be sustained due to the capacity threshold being exceeded

- 7.12. The five reasonable broad options were then appraised using the SA Framework summarised in **Chapter 6** of this SA Report. The key outcomes of this appraisal process are summarised below.

APPRAISAL OF BROAD OPTIONS

- 7.13. The detailed appraisal of broad options for the plot ratios and transport strategies at NRP against the sustainability objectives is presented in **Appendix 7**. A summary of the results is provided below.
- 7.14. **Table 7.5** summarises the number of times a broad option received a particular score (i.e. ++, +, ++/-, etc) against the sustainability objectives. Whilst all options have both positive and negative effects against a range of sustainability objectives, there is a clear split between those broad options that include the mixed public transport and car access strategy and those that include the car-dependant access strategy. Broad options 1-3 have the highest number of significant positive effects and the lowest number of significant negative effects. In contrast, those options that include the car dependant access strategies (broad options 4 and 5) have the lowest number of significant positive effects, yet the highest number of significant negative effects.
- 7.15. As set out in para. 7.4, individual options were ranked in order to capture the relative performance of the broad options. **Table 7.6** summarises these rankings in terms of the number of times each option received a ranking of 'first', 'second', 'third', and so on.

Table 7.5: Summary of Scores

Score	Broad options				
	1: Mixed public transport and car access strategy and 16% plot ratio	2: Mixed public transport and car access strategy and 19% plot ratio	3: Mixed public transport and car access strategy and 24% plot ratio	4: Car dependant access strategy and 16% plot ratio	5: Car dependant access strategy and 19% plot ratio
++	6	6	6	4	4
+	2	2	2	4	4
++/-	1	1	1	0	0
++/--	0	0	0	1	1
+/-	1	1	1	0	0
+/--	1	1	1	2	2
-	5	5	5	3	3
--	2	2	2	4	4

- 7.16. **Table 7.6** shows that option 1 (mixed public transport and car access strategy and 16% plot ratio) received the highest number of 'firsts' than any of the other broad options, but also received a number of rankings of 'fourth' and 'fifth' where it did not perform as well as the other options. Option 3 (mixed public transport and car access strategy and 24% plot ratio) also received a number of 'firsts', but had a higher total number of rankings at 'third', 'fourth' and 'fifth' compared to option 1. Option 5 (car dependant access strategy and 19% plot ratio) received the lowest number of 'firsts' and had the greatest number of 'fifths'.

- 7.17. **Table 7.7** brings the results of the analysis together into an overall ranking by adding up the individual ranks against each sustainability objective for each broad option. The lower the total, the better the sustainability performance. **Table 7.7** shows that the best performing broad option was option 2 (mixed public transport and car access strategy and 19% plot ratio), which performed marginally better than option 1 (mixed public transport and car access strategy and 16% plot ratio). Option 3 (mixed public transport and car access strategy and 24% plot ratio) was the mid-performing option, despite having a high number of first rankings (**Table 7.6**). Option 4 (Car dependant access strategy and 16% plot ratio) and option 5 (Car dependant access strategy and 19% plot ratio) were the worst performing options by some margin.
- 7.18. The above summary results only paint a partial picture of the sustainability advantages and disadvantages for each option. For example, the use of rankings was only used to capture subtle differences between options and no 'weight' or influence was given to one objective over another. Therefore, they need to be read in conjunction with the detail appraisal presented in **Appendix 7**.
- 7.19. The process of sustainability appraisal also provides for a considered judgement of the individual merit of the different broad options. Therefore, the sustainability performance of each option is discussed below.

Table 7.6: Summary of Rankings

Number of times ranked (either individually or equally) ...	Broad options				
	1: Mixed public transport and car access strategy and 16% plot ratio	2: Mixed public transport and car access strategy and 19% plot ratio	3: Mixed public transport and car access strategy and 24% plot ratio	4: Car dependant access strategy and 16% plot ratio	5: Car dependant access strategy and 19% plot ratio
First	13	5	9	4	3
Second	0	12	1	3	3
Third	1	2	4	1	5
Fourth	5	1	3	10	5
Fifth	1	0	3	2	4

Table 7.7: Overall Rankings

Broad options	Total of rankings	Overall rank
Option 2: Mixed public transport and car access strategy and 19% plot ratio	39	1
Option 1: Mixed public transport and car access strategy and 16% plot ratio	41	2
Option 3: Mixed public transport and car access strategy and 24% plot ratio	50	3

Broad options	Total of rankings	Overall rank
Option 4: Car dependant access strategy and 16% plot ratio	63	4
Option 5: Car dependant access strategy and 19% plot ratio	64	5

Broad options 1-3

- 7.20. These options perform the least negatively against the environmental objectives. Encouraging access to NRP by sustainable modes of transport minimise the negative effects associated with further development at NRP, especially in terms of reducing contributions to climate change and the effects of traffic on the environment. Option 1 always performed the least negatively against the environmental objectives. Having the lowest plot ratio of the three options, option 1 is expected to result in the lowest amount of development and fewest journeys by car/public transport, reducing the negative effects of further development of NRP on the environment.
- 7.21. By generating employment uses and providing services and facilities on site, options 1-3 also tended to perform positively against the social and economic objectives. In general, option 3 tended to perform the most positively in relation to these objectives. Having the highest plot ratio, option 3 presented the highest number of opportunities for employment, to improve education and skills and to encourage sustained economic growth.

Broad options 4-5

- 7.22. Options 4 and 5 tend to perform most negatively against the environmental objectives. These options provide full standard parking, which is likely to encourage employees and visitors to access NRP using the private car. This is likely to increase traffic in the area, negatively affecting concentrations of greenhouse gases, the effect of traffic on the environment, and noise and vibration associated with transport. Option 5 generally performs the most negatively against the environmental objectives. Having the highest plot ratio of the two options, option 5 is expected to result in the highest amount of development and largest increase in the number of journeys by car.
- 7.23. By generating employment uses and providing services and facilities on site, options 4 and 5 are also expected to perform positively against the social and economic objectives. However, they are not expected to perform as positively against these objectives as options 1-3. This is largely because the car-dependant strategies tend to focus on highway improvements and provide full standard car parking. Whilst this will improve access to existing services and new employment opportunities in the area, it will focus these improvements on car-owners, not necessarily those who would benefit most from a development serviced by public transport.
- 7.24. Compared to option 4, option 5 tends to perform the most positively in relation to social and economic objectives. Having the highest plot ratio, option 5 presents the

highest number of opportunities for employment, to improve education and skills in the area and to encourage sustained economic growth.

SELECTION OF THE PREFERRED BROAD OPTION

- 7.25. The simple ranking and scoring undertaken as part of the SA highlighted options 1 and 2 as having the most positive and least negative sustainability implications. However, it is noted that the appraisal did not apply any weightings based on the prioritisation of issues. The broad option that was taken forward by South Norfolk Council as the Preferred Option was the mixed public transport and car access strategy with development at 24% plot ratio option (broad option 3). This was considered by the Council to be the most beneficial option that balances optimal economic growth, employment creation, improved education and skills with practical, considered environmental mitigation. The findings of the SA were considered in arriving at this decision and recommendations made through the appraisal of the preferred broad option (set out below) were incorporated in the preparation of the detailed options and Development Brief where appropriate.

Preferred broad options: Recommendations

- 7.26. **Table 7.8** describes a number of ways in which the positive effects of implementing the preferred broad option could be enhanced and the negative effects could be mitigated. It sets out how these measures were considered in the development of the detailed options and Development Brief where appropriate.

Table 7.8: Recommendations to maximise the positive impacts and mitigate the negative impacts associated with the Preferred Broad Option

Recommendation	How recommendation was considered in the detailed options and Development Brief
Enhancing the positive impacts	
Ensuring adequate facilities and services are provided as part of development at NRP. These facilities and services should complement those that already exist in the area.	Suitable ancillary uses to the core research and development function of a proposal for NRP are set out in Part 5: Use Class Variations of the Development Brief.
Ensuring that new local services are adequately served by sustainable modes of transport.	The use of sustainable modes of transport is set out in the Circulation Plan of the Developmentn Brief.
Incorporating design principles that help to design-out crime in the development.	The Development Brief seeks to orientate buildings in a manner which encourages various occupiers to interact in open spaces. This is likely to increase natural surveillance, increasing the safety of users and reducing crime.
Mitigating the negative impacts	
Undertaking a preliminary Phase I habitat survey to identify the existence of protected species or habitats. If they are present,	The Development Brief requires an ecological study to be carried out for Colney Hall to ensure proposals are sensitive to the

Recommendation	How recommendation was considered in the detailed options and Development Brief
habitats should be protected/enhanced on-site where possible. However, off-site mitigation or replacement habitat may be required where on-site mitigation is not appropriate (e.g. in the case of protected birds dependant on arable farmland and grassland habitats).	complexity of the site. It also requires an enhanced Phase I ecological survey to be a prerequisite for a Management Plan for Colney Hall in addition to specialist surveys recommended by the Phase I survey.
Incorporating adaptation measures into development at NRP to reduce the vulnerability of the site to all aspects of climate change. E.g. the use of Sustainable Drainage Systems (SuDS) to respond to the increased risk of flooding, the use of appropriate cooling and ventilation systems to address anticipated future higher temperatures, etc.	The Development Brief includes a section on Climate Change which requires buildings to make allowances for anticipated climate changes. The Sustainable Drainage section of the Development Brief requires the sizing of drainage systems to anticipate more violent rainfall events predicted through climate change. It also requires developers to incorporate SuDS where appropriate. The Size and Massing section of the Development Brief recommends that buildings are orientated to maximise the benefits of natural daylight throughout the year and reduce the effects of solar gain. The Landscape within Plots section of the Development Brief requires landscaping to create shade to modify climate and create usable exterior environments and anticipate likely climate change.
Ensuring the efficient use of energy in development proposals.	Covered in the 'Climate Change' section of the Development Brief.
Ensuring good practice construction procedures are followed to minimise the effects of noise, vibration and light pollution, e.g. use of appropriate sound insulation on all construction machinery.	Covered throughout the Development Brief. E.g. the section on 'Lighting and Security' seeks to minimise light spillage.
Adopting design principles that complement or enhance local landscapes.	Covered in the 'Building Materials' and 'Landscape within Plots' sections of the Development Brief
Ensuring that phasing of development leaves land packages favourable for ongoing agricultural use until developed.	The phasing of the Core Area retains plots suitable for agriculture while sections of NRP are developed.
Using water efficient fixtures and fittings and consider the use of water re-use/recycling.	The Development Brief includes a section on 'Climate Change' which seeks to ensure that buildings maximise water conservation. The 'Sustainable Drainage' section of the Development Brief requires developers to

Recommendation	How recommendation was considered in the detailed options and Development Brief
	consider the use of rainwater harvesting from suitably cleaned roof and hard surface run-off.
Considering the incorporation of SuDS to help protect water quality.	The Development Brief includes a section on 'Sustainable Drainage' which requires the use of SuDS where appropriate.
Ensuring that there is maximum access to recycling facilities on site.	Recycling facilities are not considered in the Detailed Options or Development Brief.
Considering the use of recycled materials or materials available on site for construction purposes.	The 'Parking, Service Access and Services' section recommends the use of recycled materials for parking areas.

DETAILED OPTIONS

- 7.27. The preferred broad option (mixed public transport and car access strategy and 24% plot ratio) was explored in more detail and alternative ways of expressing this option were developed. Allocations south of the BI 108 (Watton Road) were considered sufficiently similar to share a common expression of development, whereas owing to its physical separation from NRP and its different environment, a separate expression of development was prepared for the Colney Hall site. Therefore, the preparation and analysis of detailed options was divided into two sets; those relating to allocations south of the BI 108, referred to as the 'Main Site', and those relating to Colney Hall. Detailed options relating to the Main Site and Colney Hall are appraised and summarised separately below.

DETAILED OPTIONS – MAIN SITE

- 7.28. Three expressions of the preferred broad option formed the detailed options for the Main Site. They are illustrated in **Appendix 8** and comprise:
- Option 1: A conventional approach with the site sub-divided into development plots each with its own demarcated perimeter and containing the requisite quantum of parking.
 - Option 2: A parkland type of development where buildings sit within a sweeping landscape with nominal demarcation of plot perimeters and parking provided in large communal car parks.
 - Option 3: A hybrid option between the above extremes with blurred plot perimeters and parking shared between groups of buildings.
- 7.29. The detailed options were appraised in a similar way to the appraisal of the broad options, using the SA Framework summarised in **Chapter 6**. The key outcomes of this appraisal process are summarised below.

Appraisal of detailed options – Main site

- 7.30. The appraisal of detailed options for the Main Site is presented in **Appendix 9**. A summary of the results is provided below.
- 7.31. **Table 7.9** summarises the scores that each of the detailed options achieved against the sustainability objectives. All options have both positive and negative effects against the range of sustainability objectives. **Table 7.9** shows that there are fairly comparable scores between the three detailed options for the Main Site, especially with regard to their number of positive effects excluding mixed scores (i.e. + or ++). All three detailed options have the same number of positive effects, although options 2 and 3 have slightly more significant positive effects (i.e. ++). The key difference between the options however is in terms of their negative effects. Whilst the total number of negative effects excluding mixed scores (i.e. - or --) is similar between the three options, option 1 has twice as many significant negative effects as options 2 and 3.
- 7.32. Therefore, options 2 and 3 are seen to perform the most positively in terms of scores awarded against the sustainability objectives – they have the highest number of significant positive effects and the lowest number of significant negative effects. In terms of their scores, there is nothing to differentiate between these options.

Table 7.9: Summary of scores of the detailed options (Main Site)

Score	Detailed options		
	1: Traditional development plots each with its own demarcated perimeter with in plot parking	2: Parkland development with nominal demarcation of plot perimeters and parking provided in large communal car parks	3: Hybrid option – blurred plot perimeters and parking shared between groups of buildings
++	4	5	5
+	6	5	5
++/-	0	1	1
++/--	0	0	0
+/-	2	2	2
+/--	0	0	0
-	2	4	4
--	5	2	2

- 7.33. As set out in para. 7.4, individual options were also ranked in order to capture the relative performance of the detailed options. **Table 7.10** summarises these rankings in terms of the number of times each option received a ranking of ‘first’, ‘second’ or ‘third’.
- 7.34. **Table 7.10** shows that the parkland development option (option 2) received the highest number of ‘firsts’ than the other two detailed options for the Main Site. The hybrid option (option 3) also received a high number of ‘firsts’, but was most frequently ranked ‘second’ in comparison to the other options. The traditional

development option (option 1) received the least number of ‘firsts’ and was most frequently ranked ‘third’ in the appraisal. In fact, the traditional development option was the only option to receive ‘third’ rankings.

Table 7.10: Summary of rankings for the detailed options (Main Site)

Number of times ranked (either individually or equally)	Detailed options		
	1: Traditional development plots each with its own demarcated perimeter with in plot parking	2: Parkland development with nominal demarcation of plot perimeters and parking provided in large communal car parks	3: Hybrid option – blurred plot perimeters and parking shared between groups of buildings
First	5	18	8
Second	0	2	12
Third	15	0	0

- 7.35. **Table 7.11** brings the results of the analysis together into an overall ranking by adding up the individual ranks against each sustainability objective for each detailed option. The lower the total, the better the sustainability performance. The best performing detailed option against the sustainability objectives was option 2 (parkland development) while the worst performing option was option 1 (traditional development). Option 3 (hybrid option) was the mid-performing option.

Table 7.11: Overall rankings for the detailed options (Main Site)

Broad options	Total of rankings	Overall rank
Option 2: Parkland development with nominal demarcation of plot perimeters and parking provided in large communal car parks	22	1
Option 3: Hybrid option – blurred plot perimeters and parking shared between groups of buildings	32	2
Option 1: Traditional development plots each with its own demarcated perimeter with in plot parking	50	3

- 7.36. These results however only paint a partial picture of the sustainability advantages and disadvantages for each option. For example, the use of rankings was only used to capture subtle differences between options and no ‘weight’ or influence was given to one objective over another. Therefore, they need to be read in conjunction with the appraisal matrix in **Appendix 9**.
- 7.37. The process of sustainability appraisal also provides for a considered judgement of the individual merit for each of the options considered. Therefore, the sustainability performance of each option is discussed below.

Detailed option 1: Traditional development

- 7.38. The traditional development option is expected to perform the least positively in terms of its environmental, social and economic performance. In terms of the environmental objectives, the following conclusions were made:
- Having a conventional approach to site layout, this option is unlikely to be as sensitively designed and integrated into the local landscape framework as the parkland and hybrid options. This could compromise the open and long views that characterise the area.
 - Detailed option 1 contains the highest number of separate parking areas, which is likely to increase the quantum of road space required to link parking areas within the circulation network. That said, relative differences in the quantum of road area between options are uncertain. Increasing the road area in NRP will reduce the amount of land available for habitat creation and green open space, increase the vulnerability to climate change owing to the increased area of impermeable surfaces, and increase the risk of contaminated run-off from the road network.
 - Given that option 1 is expected to have the least amount of open space compared to the other options, there is least potential to accommodate renewable energy schemes in the layout or accommodate these at a later date if not integrated into the initial scheme.
 - Option 1 allocates parking in close proximity to buildings which could encourage those working at NRP to travel by car, increasing traffic volumes and congestion. This is likely to reduce air quality and result in an increase in noise and vibration from road traffic compared to other options.
- 7.39. Option 1 is also likely to perform the least positively against the social objectives. Having demarcated perimeters around each development plot, the traditional development option is unlikely to encourage the integration and mixing of employees from different research and development entities compared to the other detailed options. This is also likely to reduce the accessibility to services and facilities for those working at NRP. Option 1 is expected to provide open space for employees and local residents, which is likely to contribute to quality of life and the health of those working at NRP and living nearby. However, the amount of this open space is likely to be less compared to the other detailed options.
- 7.40. Option 1 is likely to encourage sustained economic growth by supporting emerging research employment uses in the District. Expansion of the site for these purposes is likely to increase the number of jobs available both in research and development posts and support staff opportunities, and the status of the area as a business and research centre.
- 7.41. Despite these positive effects however, the traditional development option is expected to perform the least positively against the economic objectives compared to the other options. Having a more conventional approach to site layout, option 1 layout could limit inward investment compared to the other options that are more integrated with the local landscape. However, having a more rigid demarcation of plot perimeters, option 1 allows components of the extension to be developed and

operated separately. This supports successful phasing of development. In addition, the traditional development option is likely to be easily accessible by a range of users, including car and public transport users.

Detailed option 2: Parkland development

- 7.42. The parkland development option consistently performs the most positively against the environmental objectives. It is likely to make the most positive contribution to biodiversity by providing a parkland type of development where buildings sit within a sweeping landscape. Depending on the management of this landscape, opportunities could be provided to link green spaces within the research park to the wider area.
- 7.43. Option 2 contains the fewest separate parking areas which will reduce the amount of road space needed to link car parks within the circulation network. However, relative differences in the quantum of road area between options are uncertain. Reducing the road area in NRP will increase the amount of land available for habitat creation and green open spaces. Increasing the number and size of open spaces in the development is likely to contribute to the quality of life and the health of those who work at NRP and live nearby. It is also likely to positively contribute to improving the satisfaction of local residents with their neighbourhoods. However, there is uncertainty associated with this assessment as the quality of open spaces and their accessibility is currently unknown.
- 7.44. Having the greatest amount of open space compared to the other options, option 2 has the greatest potential to accommodate renewable energy schemes in the layout or accommodate these at a later date if not integrated into the initial scheme.
- 7.45. As with all of the options, option 2 is expected to increase traffic generation to the site to access employment facilities and services. Parking is located some distance from the buildings in large communal car parks under this option. This is expected to encourage employees at NRP to use public transport as it reduces the convenience of travelling by car. As a result, it will have less significant negative effects on traffic volumes, congestion and the environment (in terms of air quality, noise and vibration) compared to the other options.
- 7.46. The parkland development option is also expected to perform the most positively against the social objectives. Having a blurred demarcation of plot perimeters and shared facilities is expected to encourage the integration and mixing of employees from different research and development entities. This is likely to reduce social exclusion within the working population of NRP and improve their accessibility to a range of services and facilities in the research park. This positive effect is only likely to come to fruition once the majority of the development has been completed and so is largely dependant on its phasing strategy.
- 7.47. Option 2 is likely to have significant positive effects on employment provision and encouraging sustained economic growth by supporting emerging research employment uses in the District. It is expected that the status of the area and its contribution to economic growth is likely to depend on, among other things, the quality of, and stimulation provided by, the setting and layout of the research park. Given that the layout of option 2 is more integrated with the surrounding landscape,

it is expected to contribute more positively to the image of the area and local economic growth compared to a more conventional site layout.

- 7.48. The key economic drawback with option 2 surrounds the phasing of development and how this will affect how well the extension to NRP 'works'. Option 2 is less easily divided into phases having a nominal demarcation of plot perimeters and parking provided in communal car parks. This could compromise the successful operation of the extension until all phases have been completed. However, this would not necessarily threaten the viability of NRP to new business interests.
- 7.49. A further potential economic limitation associated with option 2 is its usability for those who want to travel by car. Whilst promoting travel by more sustainable modes of transport supports the environmental objectives, the contribution of the area to economic growth is likely to depend on, among other things, its accessibility by a range of users, including both car and public transport users. Option 2 provides parking away from some buildings which could limit inward investment from those employers who would like to use cars to access their place of work.

Option 3: Hybrid option

- 7.50. Option 3 performs well against the environmental objectives, although consistently ranks mid-way in comparison to the other two options. Parking is shared between groups of buildings in option 3 which results in a relatively high provision of open space in the scheme layout (although not as high as under option 2). Providing open spaces in the development is likely to contribute to the quality of life and health of those who work at NRP and live nearby, and the satisfaction of local residents with their neighbourhoods. However, there is uncertainty associated with this assessment as the quality of open spaces and their accessibility is currently unknown.
- 7.51. Having a number of open spaces, option 3 also has the potential to accommodate renewable energy schemes in the layout or accommodate these at a later date if not integrated into the initial scheme, allocate land for habitat creation, and reduce the relative vulnerability of the development to climate change by maintaining an area of permeable surfaces.
- 7.52. Option 3 is expected to increase traffic generation to the site to access employment facilities and services. The hybrid option allocates shared parking between groups of buildings. Ensuring that each building does not have its own designated parking area could encourage the uptake of non-car modes. As a result, it will help to minimise traffic volumes, congestion and the effects of traffic on the environment (in terms of air quality, noise and vibration). However, this option is not expected to reduce traffic volumes to the same extent as option 2.
- 7.53. Option 3 performs well against the social objectives, although again consistently ranks mid-way in comparison to the other two options. Having shared facilities, option 3 is expected to encourage the integration and mixing of employees from different research and development entities, although to a lesser degree than option 2 which has a more blurred demarcation of plot perimeters. This is likely to positively contribute to social inclusion within the working population of NRP and improve their accessibility to a range of services and facilities in the research park.

- 7.54. The hybrid option generally performs the most positively against the economic objectives. It is likely to have significant positive effects on employment provision and encouraging sustained economic growth in the area. It is well integrated into the surrounding landscape which is likely to improve the image of the area and encourage inward investment to the research park. Having a relatively 'compartmentalised' layout, option 3 is more easily divided into components that could be developed and operated separately allowing for the easy and successful phasing of development. In addition, the hybrid option is likely to be easily accessible by a range of users, including car and public transport users.

SELECTION OF PREFERRED DETAILED OPTION FOR THE MAIN SITE

- 7.55. The simple ranking and scoring undertaken as part of the SA highlighted options 2 and 3 as having the most positive and least negative sustainability implications. However, it is noted that the appraisal did not apply any weightings based on the prioritisation of issues. In addition, the SA Framework includes a different number of objectives under the environmental, economic and social objectives which could have influenced the results if an option performs particularly well environmentally, economically or socially. For example, option 2 performed well on environmental issues. It could therefore be suggested that the higher number of environmental SA objectives compared to social and economic SA objectives could have influenced the relative performance of this option.
- 7.56. The detailed option that was taken forward by South Norfolk Council was the hybrid development option (detailed option 3). This was considered by the Council to be the most beneficial option given its economic performance and good environmental standards that are complementary to the positive environmental aspects that the parkland development layout would bring. The findings of the SA were considered in arriving at this decision and recommendations made through the appraisal of the preferred detailed option for the Main Site (set out below) were incorporated in the Development Brief where appropriate.

Preferred detailed option for the Main Site: Recommendations

- 7.57. **Table 7.12** describes a number of ways in which the positive effects of implementing the preferred detailed option for the Main Site could be enhanced and the negative effects could be mitigated. It sets out how these measures were considered in the preparation of the Development Brief.

Table 7.12: Recommendations to maximise the positive impacts and mitigate the negative impacts associated with the preferred detailed option for the Main Site

Recommendation	How recommendation was considered in the detailed options and Development Brief
Enhancing the positive impacts	
Integrate ecological networks (including green patches and green corridors) within	The section on 'Landscape within Plots' in the Development Brief requires preparation of a

Recommendation	How recommendation was considered in the detailed options and Development Brief
the research park.	landscape plan which should be fully integrated with the overall site plan to maximise synergy with landscape infrastructure and corridors.
Incorporate ecosensitive edges to the research park and green spaces, especially next to water bodies, to facilitate the movement of species between habitats.	The landscape plan requires attention to be paid to plot boundary treatment. This could be improved to specifically refer to the incorporation of ecosensitive edges.
Ensure that the design layout maximises connectivity between green spaces in the research park and adjacent habitats.	The landscape plan requires attention to be paid to the integration with adjacent landscape infrastructure.
Requiring developments to achieve Breeam standards.	The Development Brief includes a section on 'Breeam' which requires developments to achieve a Breeam rating of 'Excellent'.
Ensure that the phasing of development takes into account the character, quality and distinctiveness of the local landscape.	Links between phasing and the local landscape are not considered in the Development Brief.
Ensure that adequate facilities and services are provided as part of development at NRP. Each phase of development at NRP should allow for sufficient provision of services and facilities.	Suitable ancillary uses to the core research and development function of a proposal for NRP are set out in Part 5: Use Class Variations of the Development Brief.
The provision of services and facilities should complement those that already exist in the area. They should be appropriately located to ensure that they satisfactorily serve the local community and those working at NRP and are adequately served by sustainable modes of transport.	Suitable ancillary uses to the core research and development function of a proposal for NRP are set out in Part 5: Use Class Variations of the Development Brief. The use of sustainable modes of transport is set out in the Circulation Plan of the Development Brief
Ensure that open spaces are well designed and meet the needs of the local community, employees at NRP and other users of the open spaces. Appropriate open spaces should be provided for each phase of the development at NRP.	The landscape plan requires attention to be paid to the creation of usable exterior environments.
A range of outdoor spaces should be provided and should have appropriate shade and vegetation to ensure their usability during warmer summers (as a result of climate change).	The Landscape within Plots section of the Development Brief requires landscaping to create shade to modify climate and create usable exterior environments and anticipate likely climate change.
Mitigating the negative impacts	
Consider the incorporation of SuDS to help protect water quality.	The Development Brief includes a section on 'Sustainable Drainage' which considers the use of SuDS where appropriate.

Recommendation	How recommendation was considered in the detailed options and Development Brief
Use water efficient fixtures and fittings and consider the use of water re-use/recycling.	The Development Brief includes a section on 'Climate Change' which seeks to ensure that buildings maximise water conservation. The 'Sustainable Drainage' section of the Development Brief requires developers to consider the use of rainwater harvesting from suitably cleaned roof and hard surface run-off.
Designs ought to seek the most efficient measures possible for abstraction and sewage loading in order to avoid undue stress on its infrastructure.	Abstraction and sewage loading are not considered in the Development Brief.
Maintaining the greenfield run-off rate through the use of SuDS. Where SuDS cannot be used, the developer should ensure that as much run-off as possible is managed on site and that sustainable methods of managing the remainder as close as possible to the site are explored.	The Development Brief includes a section on 'Sustainable Drainage' which considers the use of SuDS where appropriate.
Reduce vulnerability to hotter summers.	The Development Brief includes a section on Climate Change which requires buildings to make allowances for anticipated climate changes. The Size and Massing section of the Development Brief recommends that buildings are orientated to maximise the benefits of natural daylight throughout the year and reduce the effects of solar gain. The Landscape within Plots section of the Development Brief requires landscaping to create shade to modify climate and create usable exterior environments and anticipate likely climate change.
Integrate renewable energy solutions into the scheme design.	Covered in the 'Climate Change' section of the Development Brief.
Encourage energy efficiency through sustainable design and construction. Developers should be required to prepare an energy consumption statement to demonstrate the consideration and integration of energy efficient techniques. There should be an overall aim for carbon neutral development at NRP.	Covered in the 'Climate Change' section of the Development Brief. The overall aim for carbon neutral development at NRP is covered in the Vision.
Ensure that phasing of development leaves packages favourable for ongoing agricultural use until developed.	The phasing of the Core Area retains plots suitable for agriculture while sections of NRP are developed.

Recommendation	How recommendation was considered in the detailed options and Development Brief
Ensure that recycling facilities are as accessible as other waste disposal facilities on site.	Recycling facilities are not considered in the Detailed Options or Development Brief.
Consider the use of recycled materials or materials available on site for construction purposes.	The 'Parking, Service Access and Services' section of the Development Brief recommends the use of recycled materials for parking areas.

DETAILED OPTIONS – COLNEY HALL

- 7.58. Three expressions of the preferred broad option formed the detailed options for the Colney Hall site. They include:
- Option 1: Development comprising an extension to the Hall, development in the rose garden, walled garden, at the pump house, and within the coniferous plantation.
 - Option 2: Development as Option 1 but with a reduced Hall extension and additional development in the coniferous plantation.
 - Option 3: Majority of development within the coniferous plantation with some at the pump house.
- 7.59. The detailed options for the Colney Hall site were appraised using the SA Framework set out in **Chapter 6**. The full appraisal of detailed options is presented in **Appendix 10**. The key outcomes are summarised below:

Appraisal of detailed options – Colney Hall

- 7.60. **Table 7.13** summarises the scores that each of the detailed options achieved against the sustainability objectives. All options have both positive and negative effects against the range of sustainability objectives. **Table 7.13** shows that there are very comparable scores between the three detailed options for the Colney Hall site. All options have the same number of positive effects (i.e. ++, +) and mixed effects (i.e. ++/-, ++/--, +/-, +/---). The only difference between the options is that options 1 and 2 did not receive any significant negative effects (i.e. --), whereas option 3 received two. These significant negative effects were recorded because option 3 includes a higher proportion of development within the coniferous plantation which adjoins the River Yare, designated as part of a County Wildlife Site. This could result in potential impacts on biodiversity and river water quality.
- 7.61. Therefore, options 1 and 2 are seen to perform the most positively in terms of scores awarded against the sustainability objectives – they do not contain any significant negative effects. In terms of their scores, there is nothing to differentiate between options 1 and 2.

- 7.62. As set out in para. 7.4, individual options were also ranked in order to capture the relative performance of the detailed options. **Table 7.14** summarises these rankings in terms of the number of times each option received a ranking of 'first', 'second' or 'third'.
- 7.63. **Table 7.14** shows that all options received a similar high number of 'first' rankings against the SA objectives, although option 1 received the highest number by one. The key difference between the options is in terms of the relative number of 'second' and 'third' rankings that each option received. Option 2 received the highest number of 'second' rankings and was never ranked 'third'. Options 1 and 3 both received 'third' rankings (option 1 receiving only one) although option 3 was never ranked 'second'.

Table 7.13: Summary of scores of the detailed options (Colney Hall site)

Score	Detailed options		
	1: Extension to the Hall, development in the rose garden, walled garden, at the pump house and within the plantation	2: Reduced Hall extension and additional development in the coniferous plantation	3: Majority of development within the coniferous plantation and some at the pump house
++	2	2	2
+	8	8	8
++/-	0	0	0
++/--	0	0	0
+/-	3	3	3
+/--	0	0	0
-	6	6	4
--	0	0	2

Table 7.14: Summary of rankings for the detailed options (Colney Hall)

Number of times ranked (either individually or equally)	Detailed options		
	1: Extension to the Hall, development in the rose garden, walled garden, at the pump house and within the plantation	2: Reduced Hall extension and additional development in the coniferous plantation	3: Majority of development within the coniferous plantation and some at the pump house
First	17	16	16
Second	2	4	0
Third	1	0	4

- 7.64. **Table 7.15** brings the results of the analysis together into an overall ranking by adding up the individual ranks against each sustainability objective for each detailed option. The lower the total, the better the sustainability performance. The best

performing detailed options for the Colney Hall site were options 1 and 2 which both received a total of 24. Option 3 was the worst performing option.

Table 7.15: Overall rankings for the detailed options (Colney Hall)

Broad options	Total of rankings	Overall rank
Option 1: Extension to the Hall, development in the rose garden, walled garden, at the pump house and within the coniferous plantation	24	1
Option 2: Reduced Hall extension and additional development in the coniferous plantation	24	1
Option 3: Majority of development within the coniferous plantation and some at the pump house	28	3

- 7.65. These results however, only paint a partial picture of the sustainability advantages and disadvantages of each option. For example, the use of rankings was only used to capture subtle differences between options and no 'weight' or influence was given to one objective over another. Therefore, they need to be read in conjunction with the appraisal matrix in **Appendix 10**.
- 7.66. The process of SA also provides for a considered judgement of the individual merit for each of the options considered. Therefore, the sustainability performance of each option is discussed below. Given that the options are all expected to result in the same number and range of jobs, the same provision of services and facilities including open space, and make a similar contribution to economic growth, their performance against the social and economic SA objectives was very comparable. Therefore, the discussion below focuses on the relative performance of the options in environmental terms.

Detailed option 1: Extension to the Hall, development in the rose garden, walled garden, at the pump house and within the coniferous plantation

- 7.67. Option 1 concentrates the largest amount of development in existing developed areas. Therefore, it is likely to minimise the loss of undeveloped land compared to the other options. It also has the greatest potential for integrating opportunities for wildlife in these areas and for improving existing undeveloped areas for wildlife.
- 7.68. Being the option with the largest quantum of development around Colney Hall, it is most likely to negatively affect the setting of the Hall and the historic landscape setting. In contrast, option 2 includes a reduced Hall extension and option 3 is likely to be more easily screened from the listed building and historic landscape given that a large proportion of its development is towards the north of the allocation within the coniferous plantation.

Detailed option 2: Reduced Hall extension and additional development in the plantation

- 7.69. Option 2 tends to perform mid-way in terms of its impacts on biodiversity and the historic environment. For example, being the option with the mid-level of development in the plantation, it is expected to reduce the effect on nearby County Wildlife Sites and River Yare compared to option 3, but have a more negative effect

on these features that option 1. Similarly, having a reduced Hall extension compared to option 1, option 2 is likely to reduce the negative effect of development on the listed building and the historic landscape setting. However, it is still expected to have a more negative effect than option 3 in which development will be more easily screened from elements of the historic environment.

Detailed option 3: Majority of development within the plantation and some at the pump house

- 7.70. Option 3 includes a higher proportion of development on land adjoining the River Yare, which is designated as part of a County Wildlife Site. Development within this area is likely to increase the risks to the site from pollution (e.g. through contaminated run-off from developed areas) and disturbance to biodiversity from construction and operational activities. This is expected to have a potentially significant negative impact on the River Yare and County Wildlife Site.
- 7.71. In addition, having a higher proportion of development in the coniferous plantation is expected to increase the loss of undeveloped land compared to the other options.
- 7.72. On the other hand, allocating the majority of development in the plantation is likely to reduce the effect of development on the setting of Colney Hall and the historic landscape setting. Development in this area is furthest from elements of the historic environment and so is likely to be more easily screened from both the listed building and historic landscape.

SELECTION OF THE PREFERRED DETAILED OPTION FOR COLNEY HALL

- 7.73. The simple ranking and scoring undertaken as part of the SA highlighted options 1 and 2 as having the most positive and least negative sustainability implications. However, it is noted that the appraisal did not apply any weightings based on the prioritisation of issues. The detailed option that was taken forward for the expression of development at Colney Hall by South Norfolk Council was option 1, which comprises an extension to the Hall, development in the rose garden, walled garden, at the pump house, and within the coniferous plantation. This was considered by the Council to be the most beneficial option given its concentration of development in existing developed areas, its potential for integrating opportunities for wildlife and its reduced effect on County Wildlife Site and River Yare compared to the other options. The findings of the SA were considered in arriving at this decision and recommendations made through the appraisal of the preferred detailed option for Colney Hall (set out below) were incorporated in the Development Brief where appropriate.

Preferred detailed option for Colney Hall: Recommendations

- 7.74. **Table 7.16** describes a number of ways in which the positive effects of implementing the preferred detailed option for Colney Hall could be enhanced and the negative effects could be mitigated. It also sets out how these measures were considered in the preparation of the Development Brief.

Table 7.16: Recommendations to maximise the positive impacts and mitigate the negative impacts associated with the Preferred Detailed Option for Colney Hall

Recommendation	How recommendation was considered in the detailed options and Development Brief
Enhancing the positive impacts	
Habitat creation and management throughout the site including: • Creation of fish-free standing water bodies with value to breeding amphibians, aquatic invertebrates/plants and foraging bats (i.e. include a range of water depths, bank profiles and water permanency). • Creation of underground bat hibernaculum and the incorporation of bat roost features into new buildings/structures. • Continued and potentially enhanced woodland management to meet biodiversity objectives. • Enhanced grassland management e.g. through the reduction of the frequency of grass cutting and the removal of grass arisings and cessation of fertiliser and other chemical treatment.	The specific Design Principles for Colney Hall require the development of a Management Plan which, among other things, requires the gradual replacement of plantations with native broadleaves and management for nature conservation objectives. The Principles for Colney Hall also require proposals to be informed by baseline studies, including a detailed ecological study and a Phase I ecological survey. These are likely to make recommendations on habitat creation and management throughout the site.
Incorporate ecosensitive edges to developed areas to facilitate the movement of species between habitats.	The landscape plan as set out in the generic Design Principles requires attention to be paid to plot boundary treatment. This could be improved to specifically refer to the incorporation of ecosensitive edges.
Ensure that the design layout maximises connectivity between habitats and green spaces at Colney Hall.	The specific Design Principles for Colney Hall require a Management Plan for the whole site which sets objectives for each of the developed and non-developed areas and proposals for achieving these objectives. Having a Management Plan for the whole site is likely to promote connectivity between green spaces.
Requiring developments to achieve BREEAM and EcoHomes standards.	The Development Brief includes a section on 'Breeam' which requires developments to achieve a Breeam rating of 'Excellent'.
Restore and appropriately manage the landscape setting of Colney Hall.	The specific Design Principles on the Hall Extension require retention of the open prospect from the Hall across the designed parkland and consideration of opportunities to improve the external appearance of the Hall, particularly previous unsympathetic additions/loss of balance on the principal elevation.
Ensure that adequate facilities and services	Suitable ancillary uses to the core research

Recommendation	How recommendation was considered in the detailed options and Development Brief
are provided as part of development at Colney Hall.	and development function of a proposal for NRP are set out in Part 5: Use Class Variations of the Development Brief.
Ensure that open spaces are well designed and meet the needs of employees of the Colney site. Appropriate open spaces should be provided should be provided for each phase of the development at NRP.	The landscape plan as set out in the generic Design Principles requires attention to be paid to the creation of usable exterior environments. These Principles are also relevant to Colney Hall.
A range of outdoor spaces should be provided and should have appropriate shade and vegetation to ensure their usability during warmer summers (as a result of climate change).	The Landscape within Plots section as set out in the generic Design Principles requires landscaping to create shade to modify climate and create usable exterior environments and anticipate likely climate change. These principles are also relevant to development at Colney Hall.
Incorporate principles that help to design out crime in the development.	The generic Design Principles require buildings to be orientated in a manner which encourages various occupiers to interact in open spaces. This is likely to increase natural surveillance, increasing the safety of users and reducing crime. These principles are also relevant to development at Colney Hall.
Encourage businesses related to the rural industry (e.g. food related businesses) to establish at NRP.	The vision of the Development Brief states that the extension to NRP will underpin the international presence of Norwich as a centre of excellence providing research in biological, chemical and environmental sciences. These sectors are related to rural industries.
Mitigating the negative impacts	
Ensuring care when completing site clearance operations during the breeding bird season (mid March to August inclusive) to avoid damage or disturbance to breeding birds.	The specific Design Principles for Colney Hall require proposals to be informed by baseline studies, including a detailed ecological study and a Phase I ecological survey and detailed specialist surveys as required by the Phase I survey. These are likely to make recommendations on the timings of site clearance operations.
Undertake a specialist bat survey of the site and additional site survey work to identify effects on protected animal species in the densely vegetated woodland areas.	The specific Design Principles for Colney Hall require proposals to be informed by baseline studies, including a detailed ecological study and a Phase I ecological survey and detailed specialist surveys as required by the Phase I survey. These are likely to raise potential effects on bats and protected animal species.
Maintaining the greenfield run-off rate through the use of SuDS. Where SuDS	The Development Brief includes a section on 'Sustainable Drainage' which considers the

Recommendation	How recommendation was considered in the detailed options and Development Brief
cannot be used, the developer should ensure that as much run-off as possible is managed on site and sustainable methods of managing the remainder as close as possible to the site are explored.	use of SuDS where appropriate. This is also applicable to development at Colney Hall.
Reduce the vulnerability hotter summers.	The following points are set out in the generic Design Principles in the Development Brief. They are relevant to development at Colney Hall: • The Development Brief includes a section on Climate Change which requires buildings to make allowances for anticipated climate changes. • The Size and Massing section of the Development Brief recommends that buildings are orientated to maximise the benefits of natural daylight throughout the year and reduce the effects of solar gain. • The Landscape within Plots section of the Development Brief requires landscaping to create shade to modify climate and create usable exterior environments and anticipate likely climate change.
Integrate renewable energy solutions into the scheme design.	Covered in the 'Climate Change' section of the Development Brief, which is relevant to development at Colney Hall.
Encourage energy efficiency through sustainable design and construction. Developers should be required to prepare an energy consumption statement to demonstrate the consideration and integration of energy efficient techniques. There should be an overall aim for carbon neutral development at NRP.	Covered in the 'Climate Change' section of the Development Brief, which is relevant to development at Colney Hall. The overall aim for carbon neutral development at NRP is covered in the Vision.
Ensure that each phase of development and the completed development at Colney Hall is well served by public transport.	Public transport access to Colney Hall is set out in the transport infrastructure improvements as described in the Development Brief.
Introducing measures to reduce impacts of air quality, noise, vibration and light pollution on species, e.g. consider appropriate lighting to minimise impacts of night-time lighting on bats.	Covered throughout the Development Brief. E.g. the section on 'Lighting and Security' in the generic Design Principles seeks to minimise light spillage.
Ensure that design is complementary to and enhances the character of the remnant historic landscape.	The specific Design Principles for Colney Hall requires development proposals to be informed by baseline studies, including one on landscape. The Principles on the Hall

Recommendation	How recommendation was considered in the detailed options and Development Brief
	landscape. The Principles on the Hall Extension require proposals to be fully sympathetic to impacts on its setting.
Ensure that recycling facilities are as accessible as other waste disposal facilities on site.	Recycling facilities are not considered in the Development Brief.
Consider the use of recycled materials or materials available on site for construction purposes.	The use of recycled materials for parking areas is considered in the 'Parking, Service Access and Services' section of the Development Brief.
Implement waste management plans during construction which help to manage construction and demolition waste by maximising re-use and recycling.	The development of waste management plans is not covered in the Development Brief.

THE DRAFT NRP DEVELOPMENT BRIEF SPD

- 7.75. As set out in **Figure 7.1**, the final appraisal stage involved testing the draft NRP Development Brief SPD (Consultation Draft) against the SA objectives. This involved appraising:
- The Vision and Objectives of the Draft NRP Development Brief SPD (set out in Part 1 of the Development Brief).
 - The Design Principles that are generic to all proposed development at NRP (set out in Part 4 of the Development Brief).
 - The Design Principles specific to development at Colney Hall (set out in Part 4 of the Development Brief).
- 7.76. The remainder of the document has not been subject to appraisal, either because it has already been assessed against the SA objectives as part of the broad or detailed options appraisals (e.g. Part 3: Towards an illustrative masterplan) or because it provides contextual information to NRP (e.g. Part 2: Context). Part 5: Use Class Variations has not been separately assessed. In line with paras 5.3 and 5.4 of the Development Brief, it has been assumed that development at NRP would comprise research and development functions and that any ancillary development would be small in scale and supportive to these functions. The appraisals undertaken on the draft NRP Development Brief SPD have therefore assessed development that carries out research and development as its core function in addition to small-scale ancillary uses where they are essential to this function.

APPRAISAL OF THE VISION AND OBJECTIVES OF THE NRP DEVELOPMENT BRIEF SPD

- 7.77. The Vision and Objectives of the Development Brief set out what the document is aiming to achieve. They are listed in paras. 2.6-2.8 of this SA Report. The Vision and Objectives need to be tested against the SA objectives to ensure that they are in accordance with the sustainability principles.
- 7.78. A detailed assessment of the Vision and Objectives is set out in **Appendix II**. As the Vision and Objectives are high-level and are fleshed out in more detail in the remainder of the Development Brief SPD, the appraisal should be treated only as a broad appraisal of possible areas of synergy or conflict with the SA objectives.
- 7.79. The following were identified as areas of potential synergy or inconsistency between the SA Framework objectives and the Vision and Objectives of the NRP Development Brief SPD.

Synergies: the Vision

- 7.80. The Vision appears to have a number of direct synergies with the environmental SA objectives. These include maximising the use of renewable energy solutions and reducing contributions to climate change, and maintaining and enhancing the distinctiveness and quality of landscapes, townscapes and the historic environment. The Vision specifically refers to contributing to these topics.
- 7.81. The Vision is expected to have synergies with the majority of social SA objectives. It is expected to contribute towards reducing poverty, inequality and social exclusion; offering opportunities for rewarding and satisfying employment; improving accessibility to services and facilities; improving education and skills; improving the health of the population; encouraging community identity; and improving the quality of where people live. This is largely because it makes specific reference to factors such as contributing to the quality of life of local people and improving the provision of services and facilities.
- 7.82. The Vision of the Development Brief also appears to have synergies with encouraging economic growth in the area by supporting emerging employment uses in the District and encouraging indigenous and inward investment in the area by providing for and accelerating the delivery of suitable locations for businesses.

Synergies: the Objectives of the Development Brief

- 7.83. The Development Brief Objectives relating to 'Promoting high-quality design and innovation', and 'Reflecting physical constraints and opportunities' appear to have synergies with the majority of environmental SA objectives. In particular, these include maintaining and enhancing biodiversity; reducing vulnerability to climate change; maximising the use of renewable energy solutions; improving air quality and minimising noise, vibration and light pollution; minimising the loss of undeveloped land; and improving water quality and providing for sustainable sources of supply and sustainable use.

- 7.84. The same Development Brief Objectives also have synergies with a number of social SA objectives. These include reducing poverty, inequality and social exclusion, encouraging community identity, and improving the quality of where people live.
- 7.85. The Objectives of the Development Brief all have synergies with encouraging economic growth in the area by supporting emerging employment uses in the District and encouraging indigenous and inward investment in the area by providing for and accelerating the delivery of suitable locations for businesses.

Conflicts: the Vision

- 7.86. There is a potential inconsistency between the Vision and minimising the loss of undeveloped land and conserving and improving the quality of soil resources. Given that NRP is located on greenfield land, it is difficult for the Vision to overcome this issue.

Conflicts: the Objectives of the Development Brief

- 7.87. The Development Brief Objective of Implementing allocations in the Local Plan would have potential conflicts with reducing the effects of traffic on the environment; minimising the loss of undeveloped land; improving water quality and providing for sustainable sources of supply and sustainable use; and minimising the production of waste. This is largely because any development would result in negative effects similar to these. These issues were raised and addressed in the appraisal of the broad options which assessed the principle and quantum of development at NRP.

APPRAISAL OF THE DESIGN PRINCIPLES

- 7.88. The Design Principles guide development at the Main Site, at Colney Hall and for any new schemes that are proposed as part of the existing components of NRP. The Design Principles include:
- Generic Design Principles that are applicable to all development at NRP; and
 - Specific Design Principles for Colney Hall given its specific environment, landscape and historic environment.
- 7.89. The Design Principles are likely to affect the significance of the potential positive and negative effects associated with the preferred quantum and expression of development at NRP (i.e. the preferred broad and detailed options respectively). They have therefore been appraised in a way that seeks to identify their effect on the results of the preferred broad and detailed options appraisals. Each Design Principle was appraised against each SA objective to see how they affected the potential positive and negative effects of the principle and preferred quantum and expression of development at NRP, e.g. whether they helped to maximise potential benefits, minimise potential negative effects or further contribute to negative impacts.
- 7.90. The generic Design Principles and Colney Hall specific Design Principles were appraised separately against the SA objectives. The detailed appraisals of these sets of Principles are presented in **Appendices 13** and **14** respectively. A summary of how both sets of Principles combine to affect the potentially significant positive and

negative effects of the preferred quantum and expression of development is set out below. It should be noted however that the Design Principles make a number of contributions to SA objectives not significantly affected by the preferred broad and detailed options. Whilst these are not identified in the summary below, the detailed appraisals should be referred to for more information.

Influence of the Design Principles on the significant positive effects associated with the principle and preferred quantum and expression of development at NRP

- 7.91. Each of the significant positive effects associated with the principle and preferred quantum and expression of development at NRP, as identified in the appraisals of the preferred broad and detailed options, will now be taken in turn to identify how the Design Principles could influence the positive effects.

To maximise the use of renewable energy solutions and reduce contributions to climate change

- 7.92. The appraisal of the preferred detailed option for the Main Site (i.e. the hybrid layout option with blurred plot perimeters and parking shared between groups of buildings) identified potentially significant positive impacts on maximising the use of renewable energy solutions at NRP and reducing contributions to climate change. The generic Design Principles include a number of measures that will help to maximise these positive impacts but others that will increase contributions to climate change from the transport sector.

Maximising positive impacts

- 7.93. The Design Principles generic to all development at NRP include the following measures that will seek to increase the use of renewable energy and reduce contributions to climate change:
- The 'Climate Change' Design Principles require planning applications to include a full energy audit of their proposals, demonstrating measures to reduce carbon emissions. By having an overall aspiration of development at NRP to achieve carbon neutrality over the life-time of the development, the Development Brief is likely to have a significant positive effect in maximising the use of renewable energy.
 - The 'Breeam' Design Principles require buildings to achieve an 'Excellent' rating under Breeam, which has the potential to positively contribute to the use of renewable energy solutions and reduce contributions to climate change. Breeam includes 'Energy' as an assessment criteria and awards points for reducing carbon dioxide emissions. However, it is possible for a building to receive an 'Excellent' Breeam rating without incorporating such elements. Therefore, whilst the 'Breeam' Design Principles could contribute to the use of renewable energy solutions and reduce contributions to climate change, there is no certainty that they will significantly influence this positive impact.

- The Design Principles outlined in the 'Building Performance' section requires developers to explore methods to meet and beat current best practice in the use of renewable energy sources. This is likely to contribute to the use of renewable energy solutions at NRP.
- The 'Size and Massing of Buildings' Design Principles require the judicious use of shading. This will contribute to energy efficiency by reducing the requirement for air conditioning, thus reducing contributions to climate change.
- The 'Building Materials' section recommends that, where possible, consideration should be given to the use of local materials. This will help to reduce contributions to climate change by minimising transport emissions associated with construction. This is likely to be further encouraged through the 'Climate Change' Design Principles which require transport emissions to be measured in an energy audit.
- The 'Lighting and Security' Design Principles state that light fittings should operate on demand where appropriate. This is likely to encourage energy efficiency, reducing emissions of carbon dioxide associated with electricity generation.

Negative influence

- 7.94. The generic Design Principles within the 'Parking, Service Access and Services' section include a number of measures to improve the parking environment at NRP (e.g. promoting a positive experience so that walks between car parks and buildings are acceptable). Similarly, the specific Design Principles for Colney Hall refer to carefully planned vehicle access routes to each of the five potential development hubs. These Principles are likely to encourage employees to drive to NRP, which will contribute to emissions of greenhouse gases from the transport sector. However, this negative impact needs to be considered in the context of the Circulation Plan and transport infrastructure improvements identified in the Development Brief, which encourage access to NRP by sustainable modes of transport (e.g. public transport, cycling, etc).

Recommendations

- 7.95. Additional measures that could be integrated in the Development Brief to further contribute to the significant positive effects include:
- The 'Building Materials' section should ensure that building materials are thermally efficient (i.e. help to regulate the internal temperature of buildings).
 - The 'Landscape within Plots' section should ensure that landscape plans consider the potential integration of renewable energy solutions where appropriate.
 - Provide 'switch off' reminder signs near light switches to ensure that they are not left on when not required in the 'Lighting and Security' section.

To offer opportunities for all sections of the population to have rewarding and satisfying employment

- 7.96. The appraisals of the preferred broad and detailed options (i.e. the preferred quantum and expression of development at the Main Site and Colney Hall) concluded that development at NRP is likely to have significant positive effects on employment provision in the area as it is expected to deliver job opportunities in the research and development sector. Both the generic and Colney Hall specific Design Principles include a number of measures that will maximise these positive impacts.

Maximising positive impacts

- 7.97. The generic Design Principles outlined in the 'Building Performance', 'Building Layout' and 'Size and Massing of Buildings' sections promote flexibility in building design. This is likely to provide working accommodation for a range of future users/occupiers. For example, the 'Building Layout' section requires developers to consider the need to extend or link buildings in the future should an occupier wish to expand and remain at NRP. This will help to retain new businesses contributing to long-term employment provision in the area.
- 7.98. The generic Design Principles set out in the 'Landscape within Plots', 'Parking, Service Access and Services' and 'Lighting and Security' sections promote a well designed landscape and a positive and safe walking environment between car parks and buildings. This is likely to contribute to a positive image of the working environment at NRP, encouraging take-up of units and contributing to the provision of satisfying employment in the area.
- 7.99. Similarly, the specific Design Principles for Colney Hall focus on the protection and enhancement of landscape and environmental features. This is likely to contribute to a positive and healthy image of the working environment at Colney Hall, encouraging investment at NRP and full occupation of the research park.

To improve accessibility to essential services, facilities and the workplace

- 7.100. The appraisal of the preferred broad option (i.e. a mixed public transport and car access strategy with development at 24% plot ratio) concluded that development at NRP could have significant positive effects on accessibility to services, facilities and the workplace. It is assumed, as set out in Part 5 of the Development Brief (Use Class Variations) that development at NRP would incorporate additional services and facilities. However, the generic and Colney Hall specific Design Principles are expected to have little influence on these positive effects.

To improve the education and skills of the population overall

- 7.101. The appraisal of the preferred broad option (i.e. a mixed public transport and car access strategy with development at 24% plot ratio) concluded that development at NRP could have significant positive effects on the education and skills of the working population in South Norfolk. Businesses that are expected to be located at NRP are required to undertake research and development work, which will provide additional research opportunities in the area and encourage the provision of highly skilled jobs.

However, the generic and Colney Hall specific Design Principles are expected to have little influence on these positive effects.

Recommendations

- 7.102. Reference should be made in the Design Principles to ensuring that services and facilities are located at appropriately central sites accessible to all.

To improve the health of the population overall

- 7.103. The appraisal of the preferred broad option (i.e. a mixed public transport and car access strategy with development at 24% plot ratio) concluded that development at NRP could have significant positive effects on the health of the local population. For example, it is likely to improve access to the Norfolk and Norwich University Hospital and provide open spaces which are likely to contribute to the quality of life and health of those who work at NRP and live nearby. The generic and Colney Hall specific Design Principles include a number of measures that will help to maximise these positive impacts but others that could conflict with these beneficial impacts.

Maximising positive impacts

- 7.104. The generic Design Principles in the 'Landscapes within Plots' section encourages the creation of high quality open spaces between buildings. The Development Brief also encourages the position and layout of buildings to facilitate the use of these open spaces. For example, the 'Building Layout' generic Design Principles seek to orientate or place buildings in a manner that encourages various occupiers to interact in the open spaces created between the buildings. These Principles are likely to maximise the positive effects associated with the contribution of open spaces to health identified in the appraisal of the preferred broad option.
- 7.105. Similarly, the specific Design Principles for Colney Hall focus on the protection and enhancement of landscape and environmental features. This is likely to contribute to a positive and healthy environment, maximising the positive effects identified in the appraisal of the preferred broad option.
- 7.106. The generic Design Principles also include measures that will contribute to a healthy working environment. For example, the 'Building Performance' and 'Size and Massing of Buildings' sections seek to regulate the internal temperature of buildings through factors such as high levels of thermal fabric insulation, solar shading and maximising the benefits of natural daylight. In addition, the 'Breeam' Design Principles require buildings to achieve an 'Excellent' rating under Breeam. This has the potential to positively contribute to the health of employees at NRP as it includes 'Health and Wellbeing' as one of the assessment issues. However, it is possible for a building to receive an 'Excellent' Breeam rating without performing well on this assessment issue. Therefore, whilst the 'Breeam' Design Principles could contribute to the health of the local population, there is no certainty that they will significantly influence this positive impact.

Negative influence

- 7.107. Measures within both the generic Design Principles and Colney Hall specific Design Principles have the potential to negatively affect the health of the local population. The generic Design Principles in the 'Parking, Service Access and Services' section include a number of measures to improve the parking environment at NRP and the Colney Hall specific Design Principles include carefully planned vehicle access routes to each potential development hub at Colney Hall. This is likely to encourage employees to drive to NRP which has the potential to both increase air pollution and reduce the uptake of healthier modes of travel such as walking or cycling.

Recommendations

- 7.108. To minimise the potential negative effects on health of encouraging car use at NRP, the generic Design Principles should encourage the use of sustainable modes of transport. For example, secure parking facilities could be provided for bicycles. In addition, the use of pedestrian and cycle networks and improved public transport facilities at NRP, as set out in the Circulation Plan of the Development Brief, should be encouraged in the generic and Colney Hall specific Design Principles.

To improve the quality of where people live

- 7.109. The appraisals of the preferred broad and detailed options (i.e. the preferred quantum and expression of development at the Main Site and Colney Hall) concluded development at NRP could have significant positive effects on the quality of where people live. The generic and Colney Hall specific Design Principles include a number of measures that will maximise these positive impacts.

Maximising positive impacts

- 7.110. The generic and Colney Hall specific Design Principles include the following measures that will seek to improve the quality of the local area for residents:
- Within the generic Design Principles, the development of a landscape plan for each component of NRP, as required in the 'Landscape within Plots' section is likely to increase the provision and quality of open spaces in the area. Similarly, the 'Sustainable Drainage' section seeks to integrate sustainable drainage systems into NRP, which is likely to result in high quality, multi-functional open spaces. Provided these are accessible to the public and are linked to nearby residential areas, they will help to improve the quality of the area for local people.
 - Similarly, the specific Design Principles for Colney Hall focus on the protection and enhancement of landscape and environmental features. This is likely to improve the visual appearance of the area, which could improve the satisfaction of people with their neighbourhoods.
 - The generic Design Principles in the 'Building Materials' section recommends the consideration of local materials where possible and notes that a variety of aesthetic solutions are applicable to the scale of buildings anticipated at NRP. Provided that good architectural design is followed, these Principles have the potential to improve the built quality of the local area. In addition, the provision

of 'Landmark Elements' at NRP is likely to contribute to the distinctiveness of development and acceptance of NRP into the local community.

- The generic Design Principles in the 'Lighting and Security' section requires any access control to use naturalised features such as waterbodies, hedges or woodlands. This is expected to be more 'acceptable' than high security fences and is likely to contribute to the aesthetic quality of the local area.

Recommendations

- 7.111. Additional measures could be integrated in the Development Brief to further contribute to these positive effects. The generic Design Principles under 'Parking, Service Access and Parking' could require open spaces to be easily accessible by the general public and to ensure that open spaces are linked to nearby residential areas.

To encourage sustained economic growth

- 7.112. The appraisals of the preferred broad and detailed options (i.e. the preferred quantum and expression of development at the Main Site and Colney Hall) concluded that development at NRP could have significant positive effects on economic growth in the District, as it is likely to support emerging research employment uses. The generic and Colney Hall specific Design Principles include a number of measures that will maximise these positive effects.

Maximising positive impacts

- 7.113. The generic and Colney Hall specific Design Principles include the following measures that will encourage sustained economic growth:
- The generic Design Principles in the 'Building Performance', 'Building Layout' and 'Size and Massing of Buildings' encourage flexibility in the internal layout, subdivision and environmental control of buildings. This flexibility is likely to support a range of different users/occupiers and help to retain occupiers as they grow and wish to expand their operations.
 - The generic Design Principles in the 'Building Materials' section encourage the appropriate design of buildings. This is likely to contribute to a positive image of the working environment at NRP which is likely to attract potential tenants. Ensuring that NRP is fully occupied will contribute to sustained economic growth in the area.
 - Generic Design Principles within the 'Building Materials' and 'Landscape within Plots' sections promote the use of local materials in the buildings and landscapes associated with NRP. This is likely to support the local economy and sustained economic growth.
 - The generic Design Principles within the 'Landscape within Plots' section encourage the creation of high quality open spaces between buildings. Similarly, the specific Design Principles of Colney Hall focus on protecting and enhancing the local landscape and environmental features. These Principles are likely to contribute to the quality of life and health of those who work at NRP. Providing

a healthy working environment is likely to encourage take-up of employment units at NRP, positively contributing to economic growth in the area.

- The generic Design Principles in the 'Parking, Service Access and Services' section include a number of measures to improve the parking environment at NRP and the Colney Hall specific Design Principles include carefully planned vehicle access routes to each potential development hub at Colney Hall. Provision of suitable parking facilities is likely to encourage take-up of employment units at NRP, especially for those dependant on/wishing to use the car to travel to work.

To encourage and accommodate both indigenous and inward investment promoting a positive impact of the District

- 7.114. The appraisals of the preferred broad and detailed options (i.e. the preferred quantum and expression of development at the Main Site and Colney Hall) concluded that development at NRP would have significant positive effects on indigenous and inward investment. It was noted that the level to which NRP will encourage this investment and promote a positive image of the District is likely to depend on, among other things, the quality of the buildings and setting of the research park. The generic and Colney Hall specific Design Principles include a number of measures that will contribute to these factors.

Maximising positive impact

- 7.115. The generic and Colney Hall specific Design Principles include the following measures that will encourage indigenous and inward investment:
- As set out above, generic Design Principles within the 'Landscape within Plots' and 'Sustainable Drainage' sections are likely to provide high quality, multi-functional open spaces. This is likely to provide a positive and healthy working environment, encouraging indigenous and inward investment to the area.
 - Similarly, the Colney Hall specific Design Principles focus on protecting and enhancing the local landscape and environmental features. This is likely to promote a positive image of the area for employment uses which is likely to encourage inward investment in the area.
 - The generic Design Principles within the 'Building Performance', 'Building Layout' and 'Size and Massing of Buildings' sections encourage flexibility in the internal layout, subdivision and environmental control of buildings. This flexibility is likely to support a range of different users/occupiers, encouraging both indigenous and inward investment.
 - The 'Landmark Elements' and 'Building Materials' sections have the potential to contribute to a distinctive and healthy environment within which to work. This is also likely to encourage both indigenous and inward investment

Influence of the Design Principles on the significant negative effects associated with the principle and preferred quantum and expression of development at NRP

- 7.116. Each of the significant negative effects associated with the principle and preferred quantum and expression of development at NRP, as identified in the appraisals of the preferred broad and detailed options, will now be taken in turn to identify how the Design Principles could influence the negative effects.

To maintain and enhance biodiversity, geodiversity, species and habitat quality and avoid habitat fragmentation

- 7.117. The appraisal of the preferred broad option (i.e. a mixed public transport and car access strategy with development at 24% plot ratio) concluded that development at NRP could have significant negative effects on local biodiversity. For example, it could disturb and fragment existing habitats and could negatively affect the County Wildlife Site to the north of NRP which borders Colney Hall, e.g. from run-off and disturbance during construction and operation of NRP. The generic and Colney Hall specific Design Principles include a number of measures that will mitigate these negative impacts.

Mitigating negative impacts

- 7.118. The generic and Colney Hall specific Design Principles include the following measures that will mitigate potential negative impacts on local biodiversity:
- Generic Design Principles within the 'Lighting and Security' section recommend that where access to the perimeter needs to be controlled, developers should consider the use of naturalised features such as ditches, hedges, woodland strips and ha-has. This is likely to positively contribute to biodiversity in the area providing movement corridors for wildlife.
 - Similarly, generic Design Principles in the 'Sustainable Drainage' section require developers to minimise and attenuate surface water run-off through the use of sustainable drainage systems which should, where possible, provide biodiversity benefits. This is likely to create habitats which could mitigate the loss of existing habitats through development of NRP.
 - The 'Breeam' generic Design Principles require buildings to achieve an 'Excellent' rating under Breeam, which has the potential to positively contribute to local biodiversity. Breeam includes 'Land Use and Ecology' as an assessment criteria and awards points for factors such as ecological enhancement, protection of ecological features, etc. However, it is possible for a building to receive an 'Excellent' Breeam rating without incorporating these elements. Therefore, there is no certainty that meeting the 'Breeam' Design Principles will significantly contribute to mitigating negative impacts associated with development at NRP.
 - The Colney Hall specific Design Principles require ecological studies to be carried out to inform development proposals and requires full ecological survey data to be provided with applications. It also recognises potential construction impacts associated with development and sets out mitigation measures. These measures

are likely to minimise the impact on biodiversity at Colney Hall and on the River Yare and nearby County Wildlife Sites.

- The Colney Hall specific Design Principles for each of the potential development hubs require the protection of existing hedges, tree belts and mature historic trees of importance. These Principles are likely to mitigate potential negative impacts on existing habitats.

Recommendations

7.119. The appraisals of the generic and Colney Hall specific Design Principles identify a number of measures that would help to further mitigate potential negative impacts of development at NRP on local biodiversity. These include:

- Incorporate the use of open spaces, habitat creation and wildlife corridors in the generic Design Principles on 'Buildings Layout'.
- Ensure that generic Design Principles within the 'Landscape within Plots' section promote the biodiversity benefits associated with a landscape plan.
- The Colney Hall Design Principles on the 'Walled Garden' and 'Plantation' could include requirements to improve the quality of their habitats.
- The Introductory section of the Colney Hall Design Principles could seek to ensure that habitats in different sections of Colney Hall are linked through the use of green corridors, open spaces, etc,

To reduce the effect of traffic on the environment

7.120. The appraisal of the preferred broad option (i.e. a mixed public transport and car access strategy with development at 24% plot ratio) concluded that development at NRP could have significant negative effects on the environment through an increase in traffic generation. The generic Design Principles include a number of measures that will help to mitigate these effects. However, the generic and Colney Hall specific Design Principles also include measures that are likely to further contribute to the negative influences associated with traffic on the environment.

Mitigating negative impacts

7.121. The generic Design Principles in the 'Climate Change' section require planning applications to include a full energy audit of their proposals, demonstrating measures to reduce carbon emissions. Assuming that this energy audit includes energy involved in transporting materials and workers during construction and operation, it could help to reduce the effect of traffic on the environment. However, the inclusion of transport emissions in the energy audit should be made explicit in the Development Brief.

7.122. The 'Breeam' generic Design Principles require buildings to achieve an 'Excellent' rating under Breeam, which includes 'Traffic' as an assessment criteria and awards points for reducing carbon dioxide emission from the transport sector (e.g. providing cycling facilities). However, it is possible for a building to receive an 'Excellent'

Breeam rating without incorporating these measures. Therefore, there is no certainty that meeting the 'Breeam' Design Principles will significantly contribute to this SA objective.

- 7.123. The generic Design Principles in the 'Building Materials' section recommends that, where possible, consideration should be given to the use of local materials. This will positively contribute to this SA objective, reducing the effect of transport on the environment.

Further negative influences

- 7.124. The generic Design Principles in the 'Parking, Service Access and Services' section include a number of measures to improve the parking environment at NRP and the Colney Hall specific Design Principles include carefully planned vehicle access routes to each potential development hub at Colney Hall. This is likely to encourage employees to drive to NRP, which will increase the effect of traffic on the local environment. However, this negative impact needs to be considered in the context of the Circulation plan and transport infrastructure improvements associated with the Development Brief, which encourage access to NRP by sustainable modes of transport.

Recommendations

- 7.125. The appraisals of the generic and Colney Hall specific Design Principles identify a number of measures that could help to further mitigate potential negative impacts of traffic associated with development at NRP. These include:
- Ensure transport emissions are considered in the energy audit, which is required to accompany planning applications, as set out in the generic Design Principles on 'Climate Change'.
 - Ensure that the use of sustainable modes of transport is encouraged by providing secure parking for bicycles. This should be referred to in the 'Parking, Service Access and Services' section of the generic Design Principles. Public transport improvements (as set out in the Circulation Plan) should also be referred to in the 'Parking, Service Access and Services' section.

To minimise the loss of undeveloped land and conserve and improve the quality of soil resources

- 7.126. The appraisals of the preferred broad option and detailed option for the Main Site (i.e. the preferred quantum and expression of development at the Main Site) concluded that development could have significant negative effects on the loss of undeveloped land as it would involve the loss of currently productive land. Given that the generic and Colney Hall specific Design Principles do not influence the location of development, they are not likely to affect this conclusion. Therefore, the significant negative effect on the loss of undeveloped land is likely to remain. However, the phasing of development at the Main Site has been proposed to retain land in agricultural use whilst areas are waiting to be developed.

To improve water qualities and provide for sustainable sources of supply and sustainable use

- 7.127. The appraisals of the preferred broad and detailed options (i.e. the preferred quantum and expression of development at the Main Site and Colney Hall) concluded that development at NRP could have significant negative effects on water quality and quantity as it would increase demand for water resources and increase the potential for water contamination. The generic and Colney Hall specific Design Principles include a number of measures that will mitigate some of these effects.

Mitigating negative impacts

- 7.128. The generic and Colney Hall specific Design Principles include the following measures that will help to mitigate the potential significant negative impacts on water quality and consumption:
- The generic Design Principles in the 'Climate Change' section require developers to maximise water conservation in buildings at NRP. This is likely to contribute to the sustainable use of water.
 - The generic Design Principles in the 'Sustainable Drainage' section requires developers to incorporate sustainable drainage systems at NRP. These will help to regulate water quality, reducing the opportunity for water contamination. This section also requires developers to consider the use of rainwater harvesting at NRP. This could help to reduce demand of water from treated supplies.
 - The 'Breeam' generic Design Principles require buildings to achieve an 'Excellent' rating under Breeam, which has the potential to positively contribute to this SA objective. Breeam includes 'Water' as an assessment criteria and awards points for reducing water consumption. However, it is possible for a building to receive an 'Excellent' Breeam rating without scoring well on 'Water'. Therefore, whilst the 'Breeam' Design Principles could contribute to water conservation, there is no certainty that they will significantly influence this positive impact.
 - The Colney Hall specific Design Principles require development in the Plantation to factor in treatment of surface water run-off given the large volumes anticipated and the absence of existing drain infrastructure. This is likely to minimise the risk of water contamination from development at Colney Hall. This is particularly significant given the proximity of the Plantation to a County Wildlife Site.

Recommendations

- 7.129. Additional measures could be integrated in the Development Brief to further mitigate the negative impacts associated with development at NRP on water quality and consumption. Whilst the 'Landscaping within Plots' section already specifies that landscaping schemes should anticipate likely climate change, specific measures could be included to ensure that water consumption is kept to a minimum in the landscaped areas. For example, consideration could be given to selecting plant species that require minimal irrigation, designing water features to minimise water consumption, etc.

COMBINED AND CUMULATIVE EFFECTS

- 7.130. The SEA Directive requires that the assessment of effects should include “secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary effects” (SEA Directive Annex I). The Development Brief SPD sets out the Design Principles that should guide and co-ordinate the form of development on land allocated as an extension to NRP. In many instances, given the generic nature of the Principles in the SPD, it is difficult to be precise about when, where and in what form the effects will arise, and how one effect might relate to another.
- 7.131. However, it is possible to draw some broad conclusions about the nature and interrelationship of the effects that the SA has identified:
- Most of the effects will be long-term, in that the Development Brief SPD aims to deliver development that will last over time. There will inevitably be some temporary and short or medium term effects, particularly during construction (e.g. amenity impacts such as noise, traffic generation, dust (air quality), and visual impact), which will vary depending on the scale, form and specific location of development. There could also possibly be effects on soils and water resources/quality during construction. However, the mitigation measures identified in the SPD and through the Habitat Regulations Assessment should help to reduce these effects.
 - The effects which have been identified in the appraisal of the SPD, both positive and negative, are likely to increase over time, as more development is delivered at NRP.
- 7.132. With respect to cumulative and synergistic effects, **Appendix 14** provides a summary of the SA findings for the preferred broad and detailed options and the generic and Colney Hall specific Design Principles, and shows how they interact together against each of the SA objectives.
- 7.133. Taking the Development Brief SPD as a whole, a number of significant cumulative impacts in relation to the SA objectives can be identified. The potentially significant positive cumulative impacts of the SPD include:
- Maximising the use of renewable energy solutions and reducing contributions to climate change;
 - Offering opportunities for all sections of the population to have rewarding and satisfying employment;
 - Improving accessibility to essential services, facilities, and the workplace, particularly for those most in need;
 - Improving the education and skills of the population overall;
 - Improving the health of the population overall;
 - Improving the quality of where people live;
 - Encouraging sustained economic growth; and

- Encouraging and accommodating indigenous and inward investment promoting a positive image of the District.
- 7.134. The potentially significant negative cumulative impacts of the SPD in relation to the SA objectives include:
- Reducing the effect of traffic on the environment; and
 - Minimising the loss of undeveloped land and conserving and improving the quality of soil resources.

IMPLEMENTATION

- 7.135. The appraisals of the preferred broad and detailed options identify both significant positive and negative effects associated with the principle and preferred quantum and expression of development at NRP. The generic and Colney Hall specific Design Principles include a number of measures that will maximise potential benefits of development at NRP, minimise potential negative impacts or further contribute to negative impacts identified in the preferred broad and detailed options appraisals.
- 7.136. Taking the Development Brief SPD as a whole, the combined and cumulative effects appraisal identified a high number of potentially significant positive effects, mainly in relation to social and economic SA objectives, compared to a small number of potentially significant negative effects in relation to traffic and the loss of greenfield land. In relation to these negative impacts, a transport assessment has been carried out as part of the Development Brief. This has recommended realistic improvements to both private and sustainable modes of transport which have been integrated into the Development Brief. A key challenge will be for the promoters of NRP to recognise the advantages associated with and fully exploit the improvements made to the sustainable modes of transport. This will help to minimise the negative transport-related impacts associated with NRP on the environment. In relation to the negative impacts on greenfield land, NRP is allocated in the South Norfolk Local Plan for research and development uses. This assumes that the principle for development in this area has already been debated and that alternative sites for research and development uses have been examined.
- 7.137. Taking these factors into consideration, the major challenge will therefore be in putting into practice what appears to be a very positive and sound Development Brief SPD. Implementation will be the key to success of the SPD and raises some key issues:
- A strong commitment is required to deliver high quality design in order to ensure that development delivers the positive benefits identified. If not, then positive effects could easily change into negative effects, for example by the delivery of development that, through its specific location and design, erodes landscape character and heritage assets rather than contributes to them. Similarly, there is guidance in the Development Brief SPD that aims to protect environmental assets, improve the environmental performance of buildings and contribute to the provision of high-quality, well-designed open spaces. These will need to be applied with rigour if development at NRP is to be truly sustainable.

- The Development Brief SPD will be equally valuable in supplementing the policies and proposals in the emerging South Norfolk Local Development Framework (LDF). Whilst it will need updating to reflect relevant policies in the Core Strategy DPD, District Wide Development Policies DPD and Site Specific Allocations DPD, it should nevertheless be retained to guide development at NRP once the LDF has been adopted.

8. MONITORING PROPOSALS

MONITORING PROPOSALS

- 8.1. This section makes recommendations for the approach to monitoring the sustainability effects of the Development Plan SPD.

What the SEA Directive requires:

“Member States shall monitor the significant environmental effects of the implementation of plans or programmes...in order, inter alia, to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action” (Article 10.1).

The Environmental Report should provide information on “a description of the measures envisaged concerning monitoring” (Annex I(i))

- 8.2. The SEA Directive requires monitoring of the significant environmental effects of implementing the plan. SA monitoring will cover the significant sustainability effects as well as the environmental effects.
- 8.3. **Table 8.1** sets out proposed measures for monitoring the sustainability effects of the Development Brief SPD. The monitoring measures proposed are linked to the SA process, including the SA objectives and decision-making criteria developed for the SA Framework, the baseline information and key sustainability issues, the likely significant effects expected, and the mitigation measures proposed.
- 8.4. The indicators proposed in **Table 8.1** are included as suggestions and include indicators that are often collected in relation to specific topics. Similar indicators already collected for other purposes (e.g. Annual Monitoring Reports, Best Value Indicators, etc.) may provide suitable alternatives. Wherever possible, existing monitoring arrangements, including information collected by outside bodies, should be used as a source of indicators. However, it is recommended that the information collected should provide a basis for understanding the sustainability effects of implementing the SPD in the context of the issues identified for monitoring in column 1 of **Table 8.1** and the information required in column 2.
- 8.5. The statutory environmental consultees and other stakeholders have already made important contributions as part of this SA, particularly in terms of baseline information. It is recommended that South Norfolk Council invite the statutory environmental consultees and other stakeholders involved in the SA process to enter into a dialogue on the monitoring proposals for the SPD. The purpose of this dialogue would be agree the sustainability effects to be monitored and information to be collected as part of the monitoring of the SPD, including who will collect the information and when.

Table 8.1: Proposals for monitoring the sustainability effects of implementing the NRP Development Brief SPD

What needs to be monitored?	Suggested indicators
Use of renewable energy	Proportion of energy produced that is from renewable sources
	Proportion of energy use that is from renewable resources
Contributions to climate change	Total Carbon dioxide emissions
	Carbon dioxide emissions per head
	Carbon dioxide emissions by source
Employment opportunities	Employment indices of deprivation
	Ethnic minority employment/unemployment
	Proportion of people claiming unemployment benefits who have been out of work for more than a year.
	Proportion of people of working age in employment
Accessibility to services, facilities and the workplace	Average distance to GPs, post office, primary school, leisure facilities, open spaces
Education and skills of the population	Education, skills and training Indices of Deprivation
	Proportion of people qualified to degree level or higher
	% of the working population with qualifications to either NVQ I/equivalent, NVQ Level 3 or 4 or a trade apprenticeship with no formal qualifications.
	People aged 16-74 with no qualifications.
Health of the population	Life expectancy
	Health and disability Indices of Deprivation
	Distance to a GP/hospital
	Number of GPs per 1000 population
Quality of where people live	Living environment Indices of Deprivation
Sustained economic growth	New business formation rate
	Number of new VAT registered businesses
	Total business stock
Encouraging inward and indigenous investment	Number of new VAT registered businesses
	Total business stock
	Change in total VAT registered business stock
	GVA per capita

What needs to be monitored?	Suggested indicators
	New business formation rate
Minimising traffic volumes	Number of bus passenger journeys
	Number of cycling trips
	Number of business travel plans
	Km length of cycle facilities
	Km length of footpath or footways
Minimising the loss of undeveloped land	Amount of previously developed land (ha)
	Number of vacant buildings
	Amount of derelict land

Land Use Consultants

January 2007

