SLR
global environmental solutions

University of Oxford

Castle Mill Graduate Accommodation

UNIVERSITY OF OXFORD

Review of Environmental Statement

On behalf of Oxford City Council

SLR Ref: 425.04519.00002

December 2014

Version: Rev 1

CONTENTS

1.0 INTRODUCTION

1.1 Introduction to ES Review Process

SLR Consulting Limited ('SLR') has been appointed by Oxford City Council ('the Council') to undertake a review of the voluntary Environmental Statement ('ES') submitted to assess the environmental impacts of the student accommodation at Roger Dudman Way on former railway land. The development (see section 4 of this Report) of 312 units in the form of study rooms and flats in eight blocks on four and five levels was granted conditional planning permission by the Council in February 2012 (Council reference 11/02881/FUL).

The development has now been constructed (2012-2013) and the accommodation has been occupied since September 2013. During the construction process, a petition based primarily on the impact of the development on views from and to Port Meadow was submitted to the Council, which included the request that a retrospective environmental impact assessment (EIA) be carried out and that its recommendations be implemented. This petition was considered by the Council's West Area Planning Committee who resolved to:

- Instruct the Head of City Development to negotiate with the University of Oxford in order to ameliorate the size and impact of the development given planning permission under 11/02881/FUL;
- Instruct the Head of City Development to report back on progress;
- Establish a working party to recommend changes to procedures or policies which the handling and determining of the planning application, including pre-application consultation, might suggest would be desirable.

Subsequent to the Committee's resolution, the University of Oxford ('the University') committed to the Council to undertake an EIA on a voluntary basis albeit the University does not consider the development to be EIA development.

1.2 SLR Consulting

Established in July 1994 and celebrating its 20th anniversary, SLR is an independent and employee controlled international environmental consultancy that has an unrivalled reputation for providing high quality tailored services. SLR provides multidisciplinary advice from in-house experts on a wide range of strategic and site specific environmental and sustainability issues. In particular, SLR specialises in providing strategic advice to both public and private sector clients and has a broad base of blue chip customers in the energy, waste management, planning and development, infrastructure, manufacturing and mining sectors. SLR is 1000 strong Worldwide with approximately 380 in the UK business spread throughout the 25 Offices.

SLR is recognised by the Institute of Environmental Management and Assessment (IEMA) as a recommended consultancy to review environmental statements for environmental impact assessments.

1.3 Scope of SLR's work

The Council instructed SLR as a specialist consultant with sufficient breadth of knowledge, skills and experience:

- To review each of the chapters of the ES in detail including the mitigation options assessed;

- To advise whether the ES has been undertaken in compliance with the relevant EIA regulations; and
- To advise the Council whether the conclusions are sound.

1.4 Format of ES Review

SLR has not sought to necessarily refute the findings presented in the ES or supplement these with other findings or conclusions. The review principally relates to the identification of areas of weakness, omission or even concealment, if applicable, in the evidence and conclusions drawn. These most often occur when certain tasks are omitted, unsuitable or *ad hoc* methodology is used, biased or inaccurate supporting data is used (often without references), or the rationale or justification of the conclusions is not given. The fundamental legislative basis for the review is the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 ('the Regulations'). An ES must comply with Schedule 4 of the Regulations, which requires that the following information is included:

Part 1

1. *Description of the development, including in particular*
    a. *a description of the physical characteristics of the whole development and the land use requirements during the construction and operational phases;*
    b. *a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;*
    c. *an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.*
2. *An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.*
3. *A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.*
4. *A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:*
    a. *the existence of the development;*
    b. *the use of natural resources;*
    c. *the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment.*
5. *A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.*
6. *A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.*
7. *An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.*

Part II

1. *A description of the development comprising information on the site, design and size of the development.*
2. *A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.*

3. *The data required to identify and assess the main effects which the development is likely to have on the environment.*
4. *An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.*
5. *A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.*

Therefore, each technical chapter within this review has assessed the following elements for each technical chapter within the ES:

- Scope;
- Methodology;
- Baseline Conditions;
- Impact Assessment;
- Mitigation Measures;
- Residual Effects;
- Impact Interaction.

In addition, SLR provides a summary of its assessment in each of the ES chapters.

A final conclusion is provided as a separate chapter at the end of this review.

2.0 DESCRIPTION OF THE SITE AND SURROUNDINGS

This corresponding chapter of the ES is factual in nature and provides a useful overview of the student accommodation granted planning permission in 2002, the existing accommodation subject of this review and the site conditions prior to development of this second phase of accommodation. It is noted that conditions prevailing to construction have been assumed in order to provide the baseline conditions against which the effects and impacts of the development have been assessed. This is reasonable given this is a post-construction ES albeit it is unclear as to the level of assumptions as it is noted there is no clarification as to the chapters where assumptions have been made (ES para. 2.1.4).

The ES chapter clearly confirms the post-development nature of the development including the provision of a badger sett.

2.1 Surrounding Area and Designations

The ES chapter factually identifies the applicable designations and describes the surrounding environs.

2.2 Future Changes

The ES identifies four developments, which have been considered in relation to cumulative effects of the subject site and these four identified. These sites are listed as:

- The Great Western Main Line Electrification project;
- Network Rail's East West Rail (EWR) project to expand operations through Oxford;
- Blavatnik School of Government, Radcliffe Observatory Quarter building, currently under construction in Walton Street;
- Westgate Centre – the Council has resolved to grant outline planning permission for the redevelopment of the Westgate Centre and adjacent land.

Whilst not mandatory, there is no confirmation that the inclusion of these four sites has been agreed with the Council who, of course, is privy to the most current information in terms of future changes within the City. It is considered that the Council is best placed to provide the most up-to-date assessment in terms of the applicability and extent of the four developments identified.

3.0 SCOPE OF THE ES

3.1 Introduction

Chapter 3 of the ES seeks to outline the scope and methodology of the EIA undertaken.

3.2 Scoping and Consultations

As identified within Section 3.2.2 *"this ES has been undertaken retrospectively, after the principal or main decision to proceed with the development (the determination of the planning application) has already been made, and after the development of student residential accommodation at the Castle Mill site has already taken place."*

The ES correctly identifies that under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 a formal 'Scoping Opinion' can be requested from the local planning authority, although this is not a mandatory requirement. Whilst not the most judicious method, the applicant's did not request a formal scoping opinion from Oxford City Council and defined the scope of the ES within the EIA team.

Paragraphs 3.2.5 and 3.2.6 correctly identify that the EIA Regulations require an ES to identify the 'likely significant effects' of a development and that these are derived from an interaction between the development, the receiving environment and the importance or sensitivity of the environmental resources or receptors. As such, a degree of professional judgement is required when considering what constitute the 'likely significant effects'.

Notwithstanding the lack of an official scoping opinion, the Chapter does identify that a range of consultations took place during the determination of the original planning application and that these have been reviewed in determining the scope of the ES (paragraphs 3.2.11 - 3.2.15).

The Chapter confirms that further informal discussions regarding the scope were undertaken with Oxford City Council (paragraph 3.2.16); whilst an ES scope was set out within a letter dated 30th October 2013 (paragraph 3.2.17). This did not, however, constitute a formal request for a scoping opinion from Oxford City Council.

Despite the factual nature of the letter detailing the proposed scope of the ES, further consultation responses were also received from a number of statutory consultees which have then been considered in determining the scope of the ES (paragraph 3.2.20). These were further expanded upon during additional consultation meetings and discussions during the preparation of the ES (paragraphs 3.2.21 – 3.2.26).

Following the above, the following elements have been identified as being elements to be assessed as part of the ES (paragraph 3.2.27):

- Landscape and Visual Impact;
- Historic Environment;
- Ecology;
- Geo-Environment;
- Flood Risk, Drainage and Water Quality;
- Traffic and Transport;
- Air Quality;
- Noise; and
- Socio-Economic Effects.

The following issues were scoped out of the ES (paragraph 3.2.28):

- Overshadowing;
- Energy and Climate Change; and
- Waste.

In light of the extensive consultations undertaken prior to the preparation of the ES and the consideration of the application during its determination, the informal scoping of the ES can be considered acceptable in terms of its compliance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

3.3 EIA Methodology

Due to the retrospective nature of the ES, the methodology is not typical for such an EIA. However, given the voluntary nature of the submission, post-development, accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 has been undertaken as far as possible.

The baseline has been defined within paragraph 3.3.4 as being pre-development. In light of this, each technical discipline chapter has been reviewed for accordance with this baseline.

As identified within paragraph 3.3.7, the main difficulty in establishing the pre-development baseline has been that *"there is an absence of evidence on the pre-development environmental conditions for a particular environmental issue, and assumptions have been made as to the environmental baseline in the hypothetical absence of the development."*

The Chapter continues by confirming that the impact, or effects, of the development in terms of potential changes to environmental conditions and receptors, when compared with the baseline, is contained within the individual ES chapters (paragraph 3.3.8).

The method for assessing the impacts is in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 in terms of assessing both the 'magnitude' and 'the level of effect' (paragraphs 3.3.10 - 3.3.11).

Again, with the ES being undertaken retrospectively, the ES has correctly identified that the main difficulties encountered in undertaking the impact assessment has been to gauge impacts which have already taken place during the construction period and due to a lack of pre-development data (paragraph 3.3.14). Notwithstanding, this can be the only option for undertaking such an ES retrospectively.

The Chapter than confirms that the individual chapters outline necessary Mitigation Measures (paragraphs 3.3.15 - 3.3.17) and Residual Impacts post mitigation (paragraph 3.3.18). This is in accordance with the requirements of Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

Finally, the Chapter also outlines the method for assessing Cumulative Impacts. Firstly, each individual chapter should assess the "*interactions between different types of effect and between measures proposed to mitigate one effect which could lead to another effect"* (paragraph 3.3.19).

Secondly, the Chapter also outlines that the ES Chapters would, where appropriate, assess the potential cumulative impacts the development would have when considered alongside the following developments:

- Great Western Main Line Electrification project;
- East West Rail project and Oxford Station redevelopment;
- Blavatnik School of Government, Radcliffe Observatory Quarter Building;
- Westgate Centre;
- Fiddlers Island student housing.

Whilst the ES is therefore compliant with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 in terms of assessing the cumulative impact of the development, it is unclear why these other developments have been identified particularly in the absence of agreement to these with the Council. In essence, it is this element of the methodology which would have benefitted from a formal scoping exercise and confirmation from Oxford City Council as to which developments should be considered for the cumulative element of the ES.

4.0 DESCRIPTION OF DEVELOPMENT

Part II of Schedule 4 of the Regulations requires for a description of the development comprising information on the site, design and size of the development.

4.1 Introduction

The description as applied for is as follows (paragraph 4.1.3):

Erection of post-graduate student accommodation comprising 312 units. Pedestrian and cycle access, 360 covered cycle bays, 3 parking spaces for disabled drivers, laundries and a communal energy centre, together with landscaping.

The full planning application submission is contained within Appendix 4.2 of the ES, which contains the Design and Access Statement that describes the site, design and size of the development. Consequently, Chapter 4 of the ES provides what is required by Part II of Schedule 4 of the Regulations.

4.2 Detailed Designs and Approvals

As a retrospective ES, the ES chapter also confirms the nature of the conditions attached to the planning permission. In addition, non-material amendments that were made to the scheme are described.

4.3 Design Mitigation Strategy

This section states that as a result of the technical assessments *i.e.* the EIA, six design mitigation measures are considered, which have been combined to result in the following three options:

- Option 1: building façade treatment and tree planting;
- Option 2: building façade treatment, tree planting and modification of roof forms to hip and low level roofs;
- Option 3: building façade treatment, tree planting, and removal of a floor from six buildings and replacement of roofs with low level roofs. A total of 33 student residence units (38 bedrooms) would be removed.

The section concludes that the University will undertake the design mitigate measures described in Option 1.

This is an unorthodox approach given that mitigation is more commonly suggested, if necessary, once the technical assessments have been undertaken *i.e.* Chapters 7-15 after the conclusions have been drawn in terms of the impacts and the significance. Option 1 is then subject to assessment in some of the chapters. In effect the concluded mitigation is then subject to part of the EIA process rather than just the description of the development.

5.0 ALTERNATIVES

5.1 Introduction

As correctly identified within Chapter 5 of the ES, the Regulations require that an ES outlines the main alternatives studied by the applicant and the main reasons for the choice made, taking into account environmental effects (Part I, Schedule 4, paragraph 2 of the EIA Regulations 2011).

By virtue of the wording of the Regulations, it is therefore accepted that if the merits of actual or hypothetical alternatives have not been studied by the promoters of a development, then there is no necessity to address such issues within an ES.

5.2 Alternative Development Options

Section 5.1.2 states that the alternative options for development were considered *"in the planning and design of the student residential accommodation"*. The alternatives considered have therefore been set against a pre-development baseline with the scheme not being in situ.

Section 5.1.4 also correctly identifies that alternatives for the mitigation of environmental effects, whilst not main alternatives, have been considered throughout the ES and within the Design Mitigation Strategy.

Section 5.2 of the submitted ES outlines the alternative options for the development that were considered by the University. The alternatives considered by the applicant outlined within this Chapter are as follows:

- A 'do nothing' option;
- Implementation of the previous reserved matters planning permission (ref. 02/00989/RES);
- Variations to the original planning permission; and
- New designs for the development.

The chapter provides a clear and legible interpretation of the alternatives considered by the University. The chapter also clearly outlines the applicant's reasons for the design decisions taken and the environmental effects associated with these.

As such, the Alternatives Chapter of the ES can be considered acceptable in terms of its compliance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

Notwithstanding the above, it should be duly noted that the Alternatives Section does not consider the three mitigation alternatives outlined within Chapter 4.6.3 of the ES. However, given that these are mitigation measures proposed following the undertaking of the voluntary ES, this does not impact upon the acceptability of the chapter.

6.0 PLANNING CONTEXT

6.1 Introduction

This Chapter of the ES provides the planning history and planning policy background considered applicable to the development.

6.2 Context and Conclusions

This is a useful Chapter in terms of providing that background and context. There is no absolute requirement under the Regulations to provide this information but ESs prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 often include sections such as this given the process is usually part of the decision-making process *i.e.* the planning application. Consequently, it is not necessary to consider whether this Chapter is in accordance with the Regulations.

The Chapter goes on to assess the proposals against the quoted policies. It is not for SLR to provide commentary on how these policies have been interpreted – that is for the Council as the decision-making authority.

What is relevant to SLR is the conclusion reached insomuch it relies on the technical assessments within the chapters. It is noted that only Design Mitigation Strategy Option 1 is considered and reference is made to the undesirability for the loss of student accommodation in the City – assumed to be referencing Option 3. It is noted by reference to Chapter 15 of the ES (paragraph 6.5.17) that the socio-economic impacts of the loss of a number of units has been part of the process to conclude that Option 1 is that to be pursued.

Paragraph 6.5.19 identifies that the determination of a planning application should be in accordance with the development plan unless material considerations indicate otherwise. The ES considers the site/development subject to the assessment to be a wholly exceptional case and states:

In this case, the public benefits of the mitigated development put forward would provide exceptional reasons which would justify the degree of harm assessed in relation to the historic landscape character and views of Oxford.

Paragraph 6.5.20 concludes:

With the improvements proposed in the Design Mitigation Strategy (Option 1), the advantages of the development would outweigh any residual harm. It would be consistent with the development plan allocation and would pay proper regard to all other material planning considerations.

An ES does not need to provide a separate conclusion when the technical assessments state the findings and any mitigation required. However, it is considered unorthodox that this Chapter concludes that Option 1 is the accepted solution prior to the reader having considered the technical assessments particularly when the process is reliant on the conclusions of those assessments *e.g.* socio-economic impacts and the accepted harm from a landscape perspective.

7.0 LANDSCAPE AND VISUAL IMPACT

7.1 Introduction

Chapter 7 of the EIA comprises a Landscape and Visual Impact Assessment prepared by Nicholas Pearson Associates (NPA). This is supported by a number of drawings and appendices which include details of the methodology, verified visual montages for the three mitigation options, and the Design Mitigation Strategy (DMS).

These sections, and other relevant sections of the EIA, have been reviewed by an experienced Chartered Landscape Architect with an existing knowledge of the site and its context. A site visit was made in November 2014.

7.2 Scope

The scope of the Landscape and Visual Impact Assessment (LVIA) and supporting material is as required by the EIA Regulations and is broadly in accordance with the latest guidance on LVIA, GLVIA3.

As recommended by GLVIA3 the methodology for the assessment is, in general, clearly set out, and for most of the report separate assessments for Landscape and Visual effects are presented.

The baseline is correctly defined as the site prior to construction of the student accommodation, and is described with aid of old photographs taken from similar viewpoints to those included in the assessment.

The relevant planning context is also described, including reference to the nearby Conservation Areas, Green Belt and the viewcones policy (HE10). Reference is also made to relevant guidance including Seeing History in the View and the latest draft of the Oxford Views Study (English Heritage, Oxford Preservation Trust, Oxford City Council). The importance of nearby heritage assets is also acknowledged and assessed in the context of the proposed development (see for example figure A:7.4.8 which identifies spire and tower positions).

The study area is defined with the aid of a Zone of Theoretical Visibility and consequently covers not only the site but also areas whose character or visual amenity has the potential to be affected by the development.

Both the construction and operational effects are assessed in accordance with best practice and GLVIA3. Seasonal effects are also considered in accordance with best practice, as are the night time effects of proposed lighting. The cumulative effects of the proposed development, in concert with other permitted and proposed developments, are also assessed.

Three potential mitigation measures are proposed and the details of these, and rationale for them, are clearly set out in the DMS.

The residual effects of the development, following mitigation by each of the three mitigation options, are also clearly assessed. In accordance with the EIA Regulations significant Landscape and Visual effects are clearly identified.

It is therefore concluded that the scope of the Landscape and Visual Assessment is thorough and accords with best practice.

7.3 Methodology

The methodology for the Landscape and Visual Impact Assessment (LVIA) is set out in Appendix 7.1 of the EIA. This Appendix does not clearly state the relationship between levels of effect and the point at which effects are considered to be significant in EIA terms. This would be helpful, as it would then be possible to clearly determine how many of the effects recorded are significant, and over what area.

In accordance with GLVIA3 there is generally a separate assessment of Landscape and Visual effects, and photographs and photomontages appear to have been prepared in accordance with Landscape Institute Guidance (advice note 01/04). Further analysis of the methodology used for the Landscape Planning Context, Landscape and Visual assessments is set out below.

Landscape Planning Context

As has been noted, a thorough review of the relevant planning context is included within the LVIA. However, the assessment does not clearly assess the Landscape and Visual effects of the development on planning designations.

For example, the visual effect of the development on Conservation Areas is carried out without any reference to any specific visual receptors or viewpoints. For the Jericho Conservation Area it is stated on page 7-68 that the proposed development is "*variously visible, in season, in glimpsed views from publicly accessible parts and from private property within the Conservation Area*", and yet no reference to any particular viewpoints or receptors is provided. Only one of the representative viewpoints, viewpoint 2, is on the edge of this Conservation Area, and even this is not alluded to in this context. As GLVIA3 states, "*it is important to remember at the outset that visual receptors are all people*" (paragraph 6.31, page 113): any analysis of the Visual effects of the development on Conservation Areas should thus refer to specific receptor groups in specific locations. Only then can the sensitivity of those receptors and the magnitude of effects be robustly assessed.

Landscape and Visual Effects on the Green Belt are largely disregarded as (for example paragraph 7.4.22 of the EIA) "*the Site lies outside the Green Belt, and the development does not affect the purposes of it*". However it is also correctly stated in the ES that Oxford Core Strategy 2026 paragraph 3.3.22 sets out the purposes of the Green Belt, which include "*to preserve the setting and special character of Oxford and its landscape setting*". The visual receptors within the Green Belt – for example all of the users of Port Meadow – should be assessed in this context: does the proposed development preserve the setting and special character of Oxford when seen by these people from this part of the designation? This is a very stringent test when viewed in the context of paragraph 88 of the NPPF, which states that "*when considering any planning application, local planning authorities should ensure that substantial weight is given to any harm to the Green Belt*."

Landscape Assessment

The Landscape assessment initially reviews existing assessments and then subdivides the Site context into nine Local Landscape Character Areas, which are then assessed as Landscape receptors. This assessment and classification process is both clear and logical. The nearby Conservation Areas are also included as Landscape receptors, which is sensible, particularly given their particular character and value. Green Belt is not regarded as a Landscape receptor, which in this case is logical given that this is not a Landscape character–derived designation but instead, as noted above, has a visual function of protecting the setting of Oxford.

In accordance with the recommendations of GLVIA3 the sensitivity of each of the Landscape receptors to the proposed development is assessed, however this is based largely upon an assessment of susceptibility rather than both susceptibility and value as recommended within GLVIA3, (see pages 7-60 to 7-66).

The magnitude of change for the Landscape receptors is then assessed, again in accordance with best practice. However, again there is no clear reference to the specific criteria set out in paragraphs 6.38 to 6.41 of GLVIA3: the rationale for arriving at the magnitude is therefore not entirely clear.

Visual Assessment

As recommended by GLVIA3 the extent of visibility is initially defined with the aid of a computer-generated ZTV. 33 viewpoints are then defined, which have been discussed and agreed with a wide range of consultees.

However, as has been noted, there are few viewpoints representing the views from Conservation Areas: only viewpoint 2 is in the Jericho Conservation Area despite the fact that views can be obtained from many private properties on William Lucy Way and from the Oxford Canal Walk. Similarly, there are no viewpoints within the Binsey Conservation Area despite the fact that there are clear views of the development from the Thames Path, at the eastern edge of the Conservation Area, and despite the recognition that views from this designation over Port Meadow to the City are "*of acknowledged value*". Judgements which are made regarding the visual effects of the development on the Conservation Areas are thus based upon generalisations, rather than specific effects on visual receptors as recommended in GLVIA3.

There are a number of viewpoints within the Green Belt, but no assessment is made of the effects of the development in relation to the functions of the Green Belt (and, more particularly, the preservation of the setting of Oxford) from these locations.

There is also no overarching assessment of the visual effects of the development (or the residual effects following mitigation) on receptor groups, such as residents, walkers or cyclists: instead, the visual assessment is limited to a detailed assessment of individual viewpoints. This misses important cumulative themes in the visual effects of the development, such as the sequential, and kinetic, experience of walkers using the Thames Path or the Oxford Canal Walk, or users of other rights of way across Port Meadow. A development seen once on a long path may be intrusive; if the development is seen repeatedly and for long periods then it becomes a dominant element along that path. Given the importance of both the Thames Path and Oxford Canal Walk as Regional Trails these should certainly be given particular consideration as sequential viewpoints. In this context it is notable that the Heritage Assessment (for example section 8.4.12) acknowledges the importance of "*kinetic views and multiple viewpoints*", such as the "*continuous sequence of views for people walking southeast across the meadow towards the city*".

It is perhaps this lack of consideration of the effects on receptor groups that causes the assessment to miss one important receptor group altogether: users of water ways. This is remarkable given that there is a sailing club (Medley Sailing Club) at Binsey and boats moored north of Fiddlers Island, as well as long boats on the Oxford Canal. The effects on these users should be considered, particularly since many are stationary/slow moving and will focus on the views of the landscape around them.

For each of the viewpoints value is assessed added, and the susceptibility is also considered within the Impact Assessment section of the LVIA. Sensitivity is thus properly determined in accordance with GLVIA3 criteria.

In accordance with the EIA Regulations the magnitude of effect caused by the existing (unmitigated) development is assessed, as well as the residual effects which would result from each of the three mitigation options. Judgements of magnitude are explained, although this assessment does not clearly apply all of the factors for assessing magnitude which are set out in paragraphs 6.38 to 6.41 of GLVIA3.

In summary, the methodology used within the LVIA broadly accords with best practice. However, there are several omissions which, when combined, could result in a lack of clarity, inaccuracies or underestimates in the assessment of effects.

7.4 Baseline Conditions

The correct baseline – the site before the existing development took place – is used and this is described in both Landscape and Visual terms.

There is a detailed review of landscape character, using both existing character assessments and then independent site assessment. In accordance with best practice a finer grain of Landscape classification for the site and surrounding areas is provided.

The baseline also includes consideration of pre-existing views, based upon a number of photographs taken before the development commenced. Whilst these photographs are not available for every viewpoint it is considered that there are sufficient upon which to base the assessment.

7.5 Impact Assessment

A clear definition is made in the LVIA, correctly, between the impact of the proposed development and the residual effects which would result from the three proposed mitigation options. The proposed development is correctly defined as the extant buildings.

For each of the Landscape and Visual receptors an assessment of sensitivity and magnitude is carried out, and the resultant impacts are recorded. Seasonal effects are taken account of, as are the effects of the construction phase and lighting at night.

Paragraph 7.4.24 then provides an overall assessment of the significance of effects, in accordance with the requirements of the EIA Regulations. This does not, however, differentiate between Landscape and Visual effects as recommended by GLVIA3, but instead provides an overall judgement.

As has been noted, Appendix 7.1 does not explain the relationship between levels of effect and judgements of significance. The overarching judgement in paragraph 7.4.24 is therefore all that exists, and it would be helpful to understand how many of the Landscape and Visual receptors – and the planning designations - are affected to a significant degree. An assessment of the impact on visual receptors within the Green Belt, in the context of the purposes of the Green Belt, should also be included here.

7.6 Mitigation Measures

Although the impact assessment does not clearly identify which Landscape and Visual impacts are regarded as significant, it is clear from paragraph 7.4.24 that the overall level of Landscape and Visual Impacts is significant. In this context it is clear that a mitigation strategy is necessary in order to reduce the residual Landscape and Visual effects.

The Design Mitigation Strategy (Appendix 7.2) sets out three clear options for mitigating the Landscape and Visual effects, the design strategy for which flows logically from both the Landscape and Visual assessment and the Heritage assessment.

However, according to the Socio-Economic assessment (chapter 15) two of the three mitigation measures assessed, (Options 2 and 3), do not seem to be economically feasible, and particularly Option 3 which would also involve the loss of 38 bedrooms. Paragraph 15.4.8 states that "*anything more than the minimum required to achieve a measure of environmental improvements would have a disproportionate effect and should not be pursued on these grounds*". It is not clear from this statement whether Options 2 and 3 should be assessed at all, since they may not be deliverable strategies.

The planting proposals contained within Option 1 include a row of 8 to 9 metre high trees planted in a narrow concrete planter in the "badger run". According to the indicative section included within the DMS this planter would be 1.8 metres wide, around 1.2m deep and would be separated from buildings within the development (for example block 6) by a path 1.5m wide. It is true that urban trees can survive within such tight planting pits, but it is worth noting that constant maintenance – particularly watering – would be essential in order to retain these trees. Strong tree anchors would also be required to guard against the risks of wind throw. It is also questionable whether it is wise to plant trees of this size so close to the buildings, since branches would be very close to windows, causing shading and possibly damage, particularly in strong winds (which will predominantly come from the west in any case). It is likely, in this context, that those responsible for the maintenance of the planting would want to cut the branches back from the buildings, thus firstly reducing their screening effect and secondly unbalancing the canopy – which would render the trees more susceptible to wind throw.

7.7 Residual Effects

As with the impact assessment, the residual Landscape and Visual effects in relation to both construction and operational impacts are assessed, this time for each of the three mitigation options. The assessment for each of the remediation alternatives is carried out with the assistance of photomontages for each option. Seasonal variations in visibility are also taken account of.

Again, the assessments are based upon an analysis of both the sensitivity of receptors and the magnitude of effect, and in accordance with the EIA Regulations a judgement regarding the overall significance of effects, for each of the three options, is set out in paragraph 7.6.15. As for the impact assessment this does not, however, differentiate between Landscape and Visual effects, nor is any detail given regarding the relationship between the levels of effect assessed and the judgement of whether an effect is significant or not.

The visual effects on Conservation Areas are again based upon a generalised assessment rather than specific receptors and/or specific viewpoints. The full effect of the development on these important areas is therefore difficult to gauge.

An assessment of the visual effects of each option upon the functions of the Green Belt for receptors within the Green Belt should also be included, particularly in view of the site's role in providing part of the setting for the historic centre of Oxford.

As has been noted, the visual assessment focuses on the effects on viewpoints rather than receptor groups. As a result effects for the users of waterways are largely ignored, and sequential effects for walkers and cyclists – who constitute the majority of users on Port Meadow and will experience repeated or consistent views in between viewpoints – are underplayed. A consideration of the sequential experience for users of both the Thames

Path and Oxford Canal Way is a particular omission, since both are popular regional trails which should merit separate consideration.

It is surprising that views from Port Meadow (for example viewpoints 9 to 13) do not mention the effects of the three mitigation options on the Oxford skyline or on the campanile of St Barnabas, but instead focus on the loss of visible vegetation on the urban edge or the appearance of the building itself. These should be essential considerations, particularly in view of the fact that the Heritage Assessment (Chapter 8) lists these as two of the most important heritage assets to be considered. Paragraph 8.4.8, for example, states, that "*the development has compromised part of the visual setting of* [St Barnabas] *by distracting from, blocking or obscuring views of the campanile from some viewpoints in the public open space along the Thames and its floodplain*". In this context the outline of St Barnabas, and other spires and towers previously visible on the skyline, should be overlain on the photomontages for the mitigation options, and a clear assessment made of the varying effects of each option on these elements.

Cumulative effects are considered, including the potential effects of both the Westgate redevelopment and the Blavatnik school of Government. It is likely that the proposed mixed –use West Way development at Botley also would be visible from Port Meadow, since the Seacourt Tower is visible to the east and this has a comparable height to the accommodation at Castle Mill and is further from the Site than West Way. This should therefore be included within the cumulative assessment as these two developments together, particularly if Option 1 and even Option 2 is pursued, could significantly increase the visibility of built development in what were previously predominantly rural views from Port Meadow.

7.8 Impact Interaction

The most significant potential interaction is with impacts on heritage assets. In this context it is worth emphasizing that the statement in paragraph 7.7.3, that the proposed mitigation measures "*will reduce the visual impact of the extant development, improve its appearance, and result in a slight increase in the visibility of certain heritage assets which are currently concealed from view*" does not accurately reflect the statement in paragraph 8.8.5 that "*the high adverse impacts on the high heritage value sites can only be reduced to medium adverse by the reduction in height of all the buildings under the Option 3*". This, in turn, should be considered in the context of the Socio-Economic assessment which, as noted, states that Options 2 and 3 should not be pursued.

7.9 Summary

The LVIA broadly fulfils the requirements of the EIA Regulations and generally follows best practice guidance, in particular GLVIA3. The inclusion of three clear mitigation measures and accompanying photomontages, in summer and spring, to help illustrate the effectiveness of each of these, is welcomed. However, there are a number of omissions which result in a lack of clarity in the conclusions or, more importantly, an understating of the potential effects. These include:

- A lack of analysis of the residual effects on specific visual receptors within Conservation Areas, in particular in Jericho and Binsey;
- No assessment of the effects of the development, in relation to the functions of the Green Belt, on receptors within the Green Belt;
- No clear relationship between the levels of Landscape and Visual effects and significant and less than significant effects;
- No separation between Landscape and Visual Effects in the overall assessment of significant effects;

- No over-arching assessment of the visual effects of the development on receptor groups, which in turn has resulted in no consideration of the views of users of waterways, and little consideration of the kinetic and sequential views which exist between viewpoints and on valued rights of way such as the Thames Path and Oxford Canal Way;
- No specific assessment of the effects of the development, and the proposed mitigation options, upon the skyline of Oxford and the campanile St Barnabas;
- No consideration of the proposed West Way development within the cumulative assessment;
- Inclusion of two mitigation options, (Options 2 and 3), which the Socio-Economic assessment concludes are not economically feasible;
- The proposed mitigation planting in the badger run seems very close to the buildings at several points, and is also within a very constrained planter which will require both anchoring for roots and constant watering.

It is recommended that these issues are addressed so that decision makers and stakeholders have a clear picture of all of the Landscape and Visual implications of each of the mitigation options.

8.0 HISTORIC ENVIRONMENT

The historic environment can be considered a finite resource and as such statutory measures are implemented towards protecting and enhancing it. Currently, non-statutory guidance in the form of National Planning Policy Framework (NPPF) [Chapter 12] plays an integral role in providing a balanced approach to formulating a decision within the planning process.

8.1 Introduction

Based on information supplied by Oxford City Council to Nicholas Pearson Associates, the development stands close to a number of designated and non-designated heritage assets and as such setting issues were considered within the ES. Immediately west of the site and the Cripley Meadows Allotments is a large expanse of designated Green Belt land that includes the neighbouring historic Port Meadow and bankside features and structures associated with the Oxford Canal and the River Thames. To the east of the site are the historic residential suburbs of Jericho and Walton Manor.

Using guidance within English Heritage's *Conservation Principles: Polices and Guidance for the Sustainable Management of the Historic Environment* (2008) the ES has identified a limited number of heritage assets that surround the site. The initial survey applied criteria from English Heritage's *Conservation Principles* (2008) in order to assess the heritage value of each site identified. Criteria included: evidential value, historic value, aesthetic value and communal value in order to arrive at a tangible and quantifiable result.

8.2 Scope

In terms of cultural heritage, the scope of the ES was to identify any adverse direct or indirect impacts that might occur within and outside the site. The site is located within an area where a number of identified heritage assets stand. It was considered within the ES that there may be potential impacts, in particular setting issues, between the development and identified heritage assets.

According to ICOMOS (*Guidance on Heritage Impact Assessments for Cultural World Heritage Properties: A publication of the International Council on Monuments and Sites* [January 2011]), Direct impacts *are those that arise as a primary consequence of the proposed development or change of use. Direct impacts can result in the physical loss of part or all of an attribute, and/or changes to its setting - the surroundings in which a place is experienced, its local context, embracing present and past relationships to the adjacent landscape. In the process of identifying direct impacts care must be taken of the development technique of gaining approvals by just avoiding direct impact - impacts which just "miss" physical resources can be just as negative to a single resource, a pattern, ensemble, setting, spirit of place etc*.

Indirect impacts occur as a secondary consequence of construction or operation of the development, and can result in physical loss or changes to the setting of an asset beyond the development footprint.

Within Article 3 of the European Union Environmental Impact Assessment Directive (85/337/EEC as amended by 97/11/EC and 2003/35/EC) it is required that the appropriate identification, description and assessment of the direct and indirect effects of projects on (amongst other things) landscape, material assets and cultural heritage. Article 4 of the Directive stipulates that where consideration of cases is being undertaken to determine whether Annex II (Schedule 2) projects should be subject to an environmental assessment,

selection criteria (Annex III) should have due regard to the environmental sensitivity of *landscapes of historical, cultural or archaeological significance*.

In England, the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (SI 2011/1824) and Circular 02/99: Environmental Impact Assessment requires a planning authority to consider whether a proposal is likely to have a significant effect on the environment, including the architectural and archaeological heritage. EIA regimes relating to other types of land-use change also require a similar approach.

This guidance and legislation is aimed at providing a balanced and fair outcome within the planning environment.

8.3 Methodology

The ES correctly employed a number of key national guidance publications which assisted in providing tangible heritage value to heritage assets that were identified within the desk-based survey and site visit. The publications included English Heritage's *Conservation Principles: Polices and Guidance for the Sustainable Management of the Historic Environment* (2008), *Seeing the History in the View: A Method for Assessing Heritage Significance within Views* (2011), *The Setting of Heritage Assets* (2011), and *Good Practice Advice on Setting and Decision-Taking* (Consultation Draft 2014).

Using the above literature the ES employs three stages of assessment:

Stage 1: A desk-based Scoping Exercise

This section of the project collated and identified (from the Oxfordshire Historic Environment Record (OHER), the Oxford Urban Archaeological Database (OUAD) and the Oxford City Council Local Plan) those heritage assets, either designated or undesignated, that had the potential to be affected by the development. The desk-based element also provided a brief historic development of the site which was supported by an historic map regression and published research literature from various repositories. All identified designated and non-designated heritage assets were described and plotted onto accompanying maps. The site - the Castle Mill student residence buildings is located within the north-west quarter of the city (bounded by the A420 and A4144 to the south, the A34 ring road to the west, Lower and Upper Wolvercote to the north and the Woodstock Road to the east).

Stage 2: Site Survey

A site visit was undertaken by the author of this ES in order to assess the potential direct and indirect impacts to cultural heritage assets that stand outside the curtilage of the site. Also considered was the historic open landscape of Port Meadow and land either side of the River Thames and the Oxford Canal; the latter being a designated heritage asset. As part of the methodology, digital images were taken from various heritage assets towards the development in order to assess the effects of setting between each.

Absent from this survey though were a number of non-designated assets that stood in close proximity to the site including several bridges that provided access between the Port Meadow car part and the development; one dating to the early part of the 20th century. On inspection by SLR, these non-designated heritage assets are considered to be of minor/local importance.

Stage 3: Assessment of Significance and Impact

The third stage included an assessment on the potential impact of the development using a recognised set of criteria set within English Heritage's *Conservation Principles* (2008) and

Seeing the History in the View (2011). From the site visit, a number of designated heritage assets were recognised; using this data each site was assessed for its significance, heritage value and its setting. The results of this exercise were produced in a tabular form within the ES.

The criterion within English Heritage's *Conservation Principles* (2008) – evidential value, historic value, aesthetic value and communal value assisted in assessing the heritage value of each site.

8.4 Baseline Conditions

The baseline conditions identified within the ES included a brief but inclusive history and development of the area in which the development stands. This section of the ES charted the chronological development of the area with the earliest presence dating to the later prehistoric era. Most of the heritage assets identified within the ES are present on detailed historic mapping and several maps dating from the 16th century. Included within the baseline was a section on the archaeology present; information was disseminated from a report undertaken by Thames Valley Archaeological Services. The author of the ES identified from this report that the topography within the curtilage of the site was undulating with up to 2-3m of remediated ground extending across the site. In addition, there were no designated heritage assets present; however, there is no mention of the presence of non-designated assets.

Based on the results of the baseline, the ES ascertained the following post-medieval chronology:

- The land under development formed part of a floodplain, organised as meadows until the expansion of the railway in the mid-19th century. Cripley Meadow and Fiddler's Island formed part of an extensive (medieval) riverside landscape that also included Port Meadow. The three meadows were separated by Castle Mill Stream. Within the meadow system are numerous earthworks of unknown form and date which may have origins in the medieval period;
- By the mid- to late-19th century the landscape in and around the development site is considered pasture/meadowland. The majority of the watercourses in and around the area are tree-lined;
- By the 1890s, the land within the development site had been given up for allotments; and
- Between 1899 and 1921 the development site had become railway sidings, serving the nearby Oxford Railway Station. The sidings continued to be used until the 1970s. Following closure, the land was cleared forming open ground until 2011.

In summary, the baseline of the ES provides a good overview of the historic and archaeological development of the area in and around the Site. In addition though, the Ordnance Survey map of 1876 shows the Site to be part of an extensive meadowland system. The north-south route of the Great Western Railway (Oxford & Birmingham Branch) extends immediately east, whilst to the west is a probable artificial watercourse that cuts across Fiddler's meadow and extends to the west and south, running parallel with the eastern bank of the River Thames (the directional flow of this watercourse is not known).

8.5 Impact Assessment

The impact assessment undertaken for the Castle Hill development within the ES considered that up to 25 heritage assets would be affected indirectly due to setting. There were no direct impacts. The indirect impacts on setting include a number of significant historic buildings/structures that occupy the Oxford City skyline. The appraisal, using guidance and criteria within English Heritage's *Seeing the History in the View* (2011) and English

Heritage's *Conservation Principles* (2008) individually assessed each building/structure (see Appendix 8.5 of the ES).

Using English Heritage's *Seeing the History in the View* (2011), the ES assessed each building/structure, affording High, Medium or Low values to each building that may have been impacted upon. High represents nationally exceptional heritage assets such as Grade I and II* buildings; Medium represents buildings/structures of national or regional importance such as Grade II Listed Buildings or buildings that stand within a Conservation Area of buildings that are of high heritage value within the local community.

Using English Heritage's *Conservation Principles* (2008) four criteria were used to assess each of the historic buildings identified within the impact assessment; these include: Historic Value, Evidential Value, Aesthetic Value and Communal Value.

The impact type assigned for each of the buildings identified within the assessment included High Adverse, Medium Adverse, Low Adverse and Imperceptible/None.

Using the above criteria, the results of the impact assessment were considered and reported in Table 8.1 of the ES. Five key issues were identified that assisted in defining and characterising the impacts of the development upon the historic environment. Summaries of the key issues within the ES included (full quote):

- Issue 1. The development exclusively impacts upon the setting of heritage assets rather than the assets *per se*.
- Issue 2. The development has high adverse impacts on the setting of **four** assets that have national and international heritage values (these are St Barnabas Church [Grade I], Port Meadow [SSSI, SAC & SM], The Oxford Skyline [Internationally recognised silhouetted skyline] and The River Thames).
- Issue 3. The nature of the adverse impacts relates to both changes to historic landscape character, and to the direct loss or obstruction of views, including those of the Oxford Skyline.
- Issue 4. Views to the heritage assets are kinetic, experienced, for example, by people walking across an open landscape with a developing sequence of views.
- Issue 5. The landscape setting of heritage assets retains some inherent dynamics, arising from seasonal changes, other development in Oxford, and landscape management by others.

In summary, the impact assessment addressed all the potential issues raised and provided a fair and honest overview of the indirect impacts that might occur.

8.6 Mitigation Measures

The three design mitigation measures are assessed in this ES chapter in order to minimise the indirect impacts of setting against the various historic assets, as follows:

- Option 1. Each of the Building façades should include sympathetic design in order to reflect the status of the building. In addition a strategic tree planting regime should be implemented;
- Option 2. The above but also to include modification of the roof forms to hip and low levels roof lines.
- Option 3. Building façade treatment, tree planting regime, removal of top floors of all five storey blocks, and modification of all roof forms to low level roofs.

8.7 Residual Effects

The ES has considered the adverse effects of the development on the historic environment. Within the ES, residual effects are subdivided into two impact types (full quote):

- Adverse impacts on the historic landscape character of the setting of both the wider historic landscape, and individual heritage assets;
- Adverse impacts on the visual extent and coherence of the Oxford Skyline – this includes the long distance views from the north and northwest, and the shorter views of individual elements of the skyline from the southern Port Meadow and the Thames.

The ES correctly considered the long-term strategies employed for the mitigation measures in order to reduce the impact on setting (*i.e.* tree planting regime and facia cladding). The tree planting regime and the historic planting does restrict the visual intrusion of eastern, western and northern elevations. Visual impacts however do occur from the northern section of Port Meadow and beyond.

Viewing the development from the south and east is restricted to limited viewpoints – much of the immediate area is tree-lined and focuses on the railway network and the railway station (located to the south-east of the development).

8.8 Impact Interaction

The ES considers that there could be impacts to the historic environment which are closely related to landscape and the visuality between the development and the established Oxford skyline. This has already been highlighted in the Impact Interaction section of Chapter 7 and need not be repeated here.

8.9 Summary

The ES chapter has undertaken all the necessary processes and assessment for this development and provided a comprehensive staged approach for addressing issues, in particular setting between heritage assets and the development.

9.0 ECOLOGY AND NATURE CONSERVATION

9.1 Introduction

In 2014 an Ecological Impact Assessment (EcIA) of the University of Oxford's Castle Mill post-graduate student accommodation development was undertaken by Ecoconsult Ltd. The subsequent ecology chapter is supported by the following documents as appendices:

- Appendix 9.1 BREEAM Ecology Report (2011)
- Appendix 9.2 Ecology Data Search Report (2014)
- Appendix 9.3 Natural England Consultation Response (2011)
- Appendix 9.4 Landscape and Ecology Habitat Management Plan for Badger Sett Area To Meet Planning Condition 18 (January, 2013)

Further field surveys were conducted in July 2014. These include surveys for water voles, otters and vegetation along a stretch of Castle Mill Stream. The details of these surveys do not appear in the appendices and should be provided.

9.2 Scope and Methodology

Survey Methodology

The following surveys were undertaken to inform the EcIA:

Extended Phase 1 Habitat Survey
An extended Phase 1 Habitat survey was undertaken on 9th March 2011 and followed the methodology in Handbook for Phase 1 Habitat Survey (JNCC, 2003) and Guidelines for Baseline Ecological Assessment (IEMA, 1995).

Badger survey
A badger survey was undertaken on 19th January 2011 and 17th March 2011 following the methods presented in Surveying Badgers (Harris *et al*., 1989). The details of the survey are presented in Appendix 9.1. The EcIA also refers to an additional visit made on 16th July, 2014 to check the artificial sett constructed as part of the mitigation for the development.

Reptile survey
The site was surveyed for reptiles using both artificial refuges and walkover observational methods following guidelines set out by the JNCC (2003). Forty-eight reptile refuges were positioned around the site on 13th August 2011 and checked on 27th, 30th and 31st August 2011, and 1st, 5th, 7th, 16th September, 2011.

Desk Study
Both the EcIA and the 2011 BREEAM Ecology Report (Appendix 9.1) refer to a data search being requested from the Thames Valley Environmental Records Centre for the site and land within 1km. Records of protected species and designated sites were requested. Badger records for the site and a 1km buffer were requested from the Oxford Badger Group.

Surveys of Castle Mill Stream
Surveys of Castle Mill Stream are presented in the EcIA. In July 2014, a section of the Castle Mill Stream was surveyed for water voles, otters and vegetation. The purpose was to assess whether there would be any impacts arising from tree planting along the stream banks. The water vole survey followed the methods in Water Vole Conservation Handbook 3rd edition (Strachan and Moorhouse and Gelling, 2011). The otter survey focused on recording field signs.

The survey methods for the Phase 1 survey, reptile survey and badger survey are appropriate and follow current guidelines and are robust. The criteria used for the desk study is appropriate. The guidelines for surveying water voles for environmental assessments recommend two survey visits, one in mid-April, May or June and a second survey in July, August or September.

It is not clear how the technical scope or geographical scope of the assessment was decided.

Whilst the report refers to an 'extended' Phase 1 habitat survey, it does not state that an assessment of the site to support rare, notable and protected species was undertaken. The site lies within a landscape of grassland, mature trees, allotments and rivers and should have been assessed for its potential to support taxa using current guidelines. Further protected species surveys may have been recommended on the basis of this assessment.

The Phase 1 habitat survey appears to be limited to the site itself and does not extend to the adjacent habitats which include allotments, mature trees, a railway embankment, watercourses and designated sites, which may fall within the zone of influence for the scheme.

It is not clear where the badger survey was undertaken. The survey should have included adjacent habitats up to at least 30 metres from the site.

Details of the extent of the surveys for otter, water vole and vegetation along Castle Mill Stream are not provided. The EcIA states that the surveys were conducted in the area affected by the tree planting.

Recommendations

- Further information is required to justify the suite of surveys that was undertaken.
- Justification should be provided for the timing of the water vole survey.
- Details of the areas surveyed should be provided. Furthermore, a justification of the geographic scope of the surveys is required.
- Any limitations to surveys should be acknowledged and their effects on the results discussed.

Assessment Methodology

The assessment methodology states that each receptor should be valued according to its specific 'biodiversity benefits' and the criteria listed by Ratcliffe (1977), and then assigned a level of value represented by a geographical scale i.e. International, National, County, Local, Neighbourhood and Less than Neighbourhood.

The magnitude of any effect on the receptor is then determined according to the change in extent or integrity of the receptor. Integrity is defined using the definition set out in ODPM Circular 06/2005.

The significance of effects on a receptor has been determined by considering both receptor value and the magnitude of the change. Combining ecological value, or sensitivity, and effect magnitude gives ecological effect significance. Effects judged to be of major or moderate significance are considered to be 'significant' effects in the context of EIA regulations.

Table 9.3 presents a matrix for determining the significance of ecological effects based on the magnitude of impacts and the value of the receptor.

Using the above methodology, the significance of impacts is dependent of the value of the receptor, whereas according to IEEM guidelines (2006) on determining ecologically significant impacts, the significance of impacts should be independent of, rather than dependant on, receptor value:

"The value of any feature that will be significantly affected is then used to identify the geographical scale at which the impact is significant. This value relates directly to the consequences, in terms of legislation, policy and/or development control at the appropriate level. So, a significant negative impact on a feature importance at one level would be likely to trigger related planning policies and, if permissible at all, generate the need for development control mechanisms, such as planning conditions or legal obligations, as described in those policies.

If an impact is found not to be significant at the level at which the resource or feature has been valued, it may be significant at a more local level." CIEEM (2006) paragraph 4.28-4.29

Recommendations

- Clarify how the assessment methodology differs from the IEEM guidelines (2006).

Policy and Guidance

The 'Policy and Guidance' section provides a summary of key international legislation, national legislation and national planning policy and local planning policy.

The EcIA makes no distinction between legislation and planning policy.

The EcIA does not include reference to the Oxford Local Plan 2001-2016 Policy NE 22, which states:

Where a planning application relates to a SAC, SSSI, SLINC or LNR or could have an adverse impact on such a site, or relates to a site that contains or is likely to contain a protected species or a UK Biodiversity Action Plan priority habitat/ species or species of conservation concern, the City Council will require the submission of:

a. *an independent ecological survey;*
b. *an assessment of the likely impact of the proposed development;*
c. *details of any measures the developers propose to mitigate any harmful effects (including the protection of part of the site or, where appropriate, the provision of a replacement habitat elsewhere); and*
d. *details of any measures to create or enhance habitats which the developers propose.*

Recommendations

- The impacts of the scheme on designated sites should be fully assessed.

9.3 Baseline Conditions

<u>Desk Study Results</u>

The 2014 desk study results are reported in both the BREEAM Ecology Report (2011) and the EcIA. The desk study identifies the Port Meadow with Wolvercote Common and Green SSSI, which forms part of the Oxford Meadows SAC as lying 75m northwest of the site. 178

species of flowering plants have been recorded at the SSSI/SAC including the internationally rare plant, creeping marshwort.

There are nine non-statutory nature conservation sites within 1km. The nearest is Cripley Island Allotment Site of Local Importance to Nature Conservation (SLINC) which lies 100m to the southwest.

The site lies within the Oxford Meadows and Farmoor Conservation Target Area.

The following rare, notable and protected species have been recorded within 1km;

- Badgers
- Bats (Leisler's bat, soprano pipistrelle, common pipistrelle, Daubenton's bat and brown long-eared bat)
- Otter
- Water vole
- Hedgehog
- Reptiles (grass snake, slowworm and common lizard)
- Amphibians (common toad and common frog)
- Birds (71 notable species)
- Invertebrates (19 notable species)
- Plants (five protected, Biodiversity Action Plan or scarce species)

Field Surveys

The Phase 1 habitat survey confirmed that the habitats present on site pre-development were; semi-improved neutral grassland, dense scrub, scattered scrub, tall ruderal, scattered tall ruderal, tree-line and hard-standing. The extent and locations of the habitats are presented on a Phase 1 habitat map and descriptions of each habitat are provided. Each habitat is evaluated according the geographic scale defined in the assessment methodology.

The vegetation of a section of the Castle Mill Stream corridor is documented.

Two badger setts were recorded, an annex sett and a subsidiary sett. These were considered to belong to the same group of badgers that have a main sett 100m to the south. The site was also used by commuting and foraging badgers. A further main sett was recorded outside the site.

A small population of slowworms was recorded along the western site boundary in 2011.

The site and adjacent river corridors were considered to have provided foraging and commuting habitats for bats. The site also had the potential to support nesting birds.

The site was not considered suitable for rare or notable invertebrates.

Only the on-site habitats have been evaluated according to the geographical scale set out in Table 9.1. The values assigned to each habitat appear to be appropriate given the size and quality of habitats on the site. Adjacent habitats are not described or evaluated apart from Castle Mill Stream. No habitat map is presented for Castle Mill Stream. Protected species are evaluated in a later section under *Effects on Protected Species*.

The locations of the badger setts and trails are not presented for review.

Recommendations

- All ecological receptors should be evaluated using the criteria set out in Table 9.1.
- A confidential appendix with details of the badger survey results should be presented.

9.4 Impact Assessment

Details of the badger sett closures and mitigation measures, which were undertaken under a Natural England licence, are presented. Details of a five year habitat management plan, which are presented in Appendix 9.4, are referred.

Impacts on badgers are stated as a loss of 0.8ha of foraging habitat. Mitigation measures are presented. Badgers are assessed as being of Neighbourhood value here, and the impact on them is stated as Minor Negative.

The loss of bat, bird and reptile habitat is quantified, and compensation measures are listed. The impact on bats is assessed as being Minor Negative to Negligible; however, the value of bats is not stated. Slowworms are assessed as being of Local value and the impact on them is Minor. The impact on birds is assessed as Minor Positive.

Impacts of tree planting on water vole habitats is discussed, but not assessed. A recommendation to minimise further shrub and tree planting is made. Impacts on otters are assessed as not significant.

Effects on on-site habitats are described and assessed using the terminology set out in Table 9.3. The effects on all habitats are assessed as Minor or Negligible. The effect of tree planting on Castle Mill Stream is discussed, but not assessed.

The effects on Port Meadow with Wolvercote Common and Green SSSI / Oxford Meadows SAC are covered briefly and the ES concludes in paragraph 9.4.34 '*There is no evidence to indicate that the development has had any adverse impact on the SAC during the construction phase, or that any such impact has arisen now it is occupied*.'

Impacts on SLINCs within 1km from increased visitor numbers are assessed as either negligible or not affected by the development.

Some information about the three proposed design mitigation options is presented in Section 9.7 *Impact Interactions and Cumulative Effects*. Details of some ecology mitigation measures and enhancement measures for ecology for the options are listed.

The methodology used to assess the effects on receptors deviates from that described in the *Scope and Methodology* section.

Although the impacts of the construction or completed development phases are described separately, only one overall assessment of effects is presented. Many of the impact and mitigation measures, such as habitat loss and the creation of new habitats, are detailed in both the construction phase impacts and completed development phase impacts and it is not clear when these impacts are considered to have taken effect. Furthermore, no distinction is made between temporary and permanent impacts.

The effects of the loss of the on-site habitats are assessed as being of negligible magnitude. This appears to contradict the criteria to for describing impact magnitude presented in Table 9.2., whereby only a low magnitude impact on a receptor of neighbourhood value would result in a negligible impact. Paragraph 9.2.13 states that '*Effect magnitude refers to changes in the extent and integrity of an ecological receptor'*, therefore the permanent loss

of the entire habitat would result in a high impact, although the impact may be on a receptor of neighbourhood value.

Only habitat loss and creation appear to have been assessed, and this is largely limited to a consideration of the areas of habitats that are lost and gained with little consideration of the quality of these habitats. There is no assessment of disturbance during either the construction or completed development phases. Disturbance, in the form of noise, vibration, and people and vehicle movements, should be assessed for its impacts on receptors on and adjacent to the site.

Impacts are described for both the construction and completed development phases, but only assessed for birds for the completed development.

The impacts on adjacent habitats and species using adjacent habitats are not assessed. The effect of tree planting on Castle Mill Stream is discussed, but not quantified. No other impacts on the stream are discussed. The impacts of tree and shrub planting along the banks of Castle Mill Stream is described as shading habitats which water voles may use in the future; however, the magnitude of this impact is not quantified.

The EcIA states that no adverse effects from the development have been identified on Port Meadow with Wolvercote Common and Green SSSI/ SAC; however, it is not clear how this conclusion was reached. Similarly, no supporting evidence is provided for the assessment of impacts on SLINCs.

Under the Habitats Regulations, Oxford City Council has the responsibility to provide sufficient information to demonstrate that likely significant effects on the SAC have been screened out.

The ES has been prepared to compare the potential impacts of three possible design options to mitigate the environmental impacts of the development, with the design mitigation measures in Option 1 proposed as the preferred solution. The EcIA should include consideration of the changes that would result from these options, and the corresponding change to the impacts. Whilst some information about the options is provided in section 9.7, an assessment has only been conducted for Option 1.

Recommendations

- The assessment of effects should be revised to follow the methods set out in the *Scope and Methodology* section;
- Impacts for the construction and completed development phases should be discussed separately and for each receptor, and the duration of each impact quantified;
- The method used to assess the magnitude of impacts should be revised so that it is consistent with that detailed in the *Scope and Methodology* section;
- An assessment of impacts other than habitat loss and gain should be undertaken for each receptor. This should cross-reference with other chapters, such as the Air Quality Assessment (Chapter 13) and Noise (Chapter 14), where the information in these chapters informs the assessment;
- More information needs to be presented to support the conclusion that there have been no significant effects on the SSSI and SAC, this may include information about the status of the qualifying features and any threats to the conservation objectives;
- More information should be presented to support the conclusion that there have been no significant effects on SLINCs;
- Each of the three design options should be assessed.

9.5 Mitigation Measures

Future habitat management measures are presented in section 9.5. Some further mitigation measures are also recommended, these include;

- Lighting will be directed away from the badger run and sett area;
- Replanting the trees along Castle Mill Stream further back from the banks and not undertaking any further tree or shrub planting along the stream bank.

It is unclear as to whether the lighting is currently directed onto the badger mitigation area. It is also unclear as to whether a firm commitment has been made to instate the measures above.

Recommendations

- Clarification is required as to whether the mitigation measures outlined in this section are recommendations, or whether a commitment has been made to adopt them;
- Clarification is required as to whether the current lighting scheme is in accordance with the badger mitigation strategy;
- Further details on the current habitats along Castle Mill Stream, and the current distribution of water voles is required to determine whether the relocation of trees is appropriate;
- A full assessment of the impacts on adjacent habitats and designated sites is required to determine whether any further mitigation measures are appropriate.

9.6 Residual Effects

The EcIA states that the residual impacts on badger, slowworm and nesting birds range from Minor negative to slight beneficial.

No assessment of residual impacts on on-site habitats, or off-site receptors is presented.

Recommendations

- The residual effects on all receptors should be stated.

9.7 Impact Interactions and Cumulative Effects

This section of the EcIA considers the impact of the scheme in combination with developments at Venneit Close and Castle Mill Phase 1. No cumulative effects are identified.

The schemes included in the cumulative assessment are not those listed in the EIA scoping in Chapter 3. Castle Mill Phase 1 is an existing development and therefore forms part of the baseline, rather than a cumulative scheme.

No cumulative effects were identified; however, there is no indication of how this conclusion was reached.

There is no assessment of cumulative effects on the SSSI or SAC.

Recommendations

- Cumulative effects should be assessed for the five schemes listed in Chapter 3.

- More information needs to be presented to support the conclusion that there have been no significant cumulative effects.
- The cumulative effects of the schemes on the SAC should be assessed separately from the assessment of effects on other receptors. Information should be provided to support the conclusion of any assessment.

9.8 Summary

SLR has identified a number of weaknesses in the EcIA and so the conclusion, that the impacts of the development on ecology are not significant, cannot be verified. The EcIA, as it stands, is not robust. This is largely because the stated methodology for assessing the significance of effects has not been followed, and the assessment of effects are not supported by sufficient evidence.

Whilst SLR is not challenging the scope of the surveys undertaken or the conclusions of the EcIA, the following information is required before the conclusions of the EcIA can be verified:

- Full details of all surveys, supported by figures where appropriate;
- A justification of the suite of surveys undertaken;
- A justification of the timing of the water vole survey;
- Details and justification of the geographic scope of the surveys;
- Details of any limitations to surveys;
- Clarification of how the assessment methodology differs from IEEM guidelines (2006);
- An assessment of the scheme on designated sites;
- An evaluation of all ecological receptors;
- An assessment of effects using the methods set out in the *Scope and Methodology* section;
- A full assessment of all the impacts of the scheme and cumulative schemes on all receptors during the construction and completed development phases with supporting evidence;
- An assessment of the three design mitigation options;
- In line with the Habitat Regulations (2010) provide sufficient information to demonstrate that likely significant effects on the SAC have been screened out;
- Clarification on whether the mitigation measures outlined in section 9.5 are recommendations, or whether a commitment has been made to adopt them;
- Clarification as to whether the current lighting scheme is in accordance with the badger mitigation strategy;
- The residual effects on all receptors;
- An assessment of the cumulative effects of the five schemes listed in Chapter 3.

10.0 GEO-ENVIRONMENT

10.1 Introduction

The Introduction of Chapter 10 begins as follows:

"This chapter considers the geological and hydrogeological setting of the Site, the potential for soil contamination associated with past uses and the potential risks arising during redevelopment. The principal objective of the assessment is to identify the potential risks associated with soil and groundwater contamination during the construction phase and from the completed development, and the mitigation measures proposed and implemented to address those risks".

That opening set outs the ES's aim to: establish the environmental setting and pre-commencement land quality baseline conditions; use assessments to identify risks requiring mitigation measures; and describe the mitigation / remediation that was undertaken.

The Introduction then brings the reader's attention to a long list of technical reports and other documents dealing with contamination, highlighting why they have been written and how they have been used before concluding that:

"As a result of the completed mitigation measures described below [in the Chapter]*, the risk of any significant harm from contamination on site has been significantly reduced as both the sources of contamination and the contamination linkages have been removed. Thus the residual effects cannot be considered to be material in the planning process. The submission of the ES could therefore enable the Council to determine the planning condition in light of the information submitted in this chapter and appendices".*

Inclusion of the documents and this conclusion in the Introduction provides the reader with an overview of the way in which "geo-environment" has been addressed from project inception until now in 2014 and remedial work that has: a) been undertaken post-consent to make the site fit for its use; and b) deal with a pollution incident which occurred during the construction period.

It can be deduced that the author is going to use all available information, but because retrospective chapters are unusual it would be very helpful to the reader if the Introduction contained a clear statement about the "retrospective nature" of the chapter. This is stated as some readers may expect a retrospective chapter to either:

- Option 1 - be "back-dated" to the point in time when it should have been written[1] – using information available by November 2011 at the time of the planning application (with no knowledge of the detailed information from Appendices 10.4 to 10.10 – see **Infobox 3**) and using that data to form a "normal" ES chapter looking at what is needed and what may happen from 2011 forward in time; or
- Option 2 - be "back-dated" to the point in time when it was requested (November 2012) or volunteered (July 2013); or

[1] The reality is that had an ES been prepared to support the 2011 planning application it would have likely been informed by Appendices 10.1 to 10.3 alone:

- Appendix 10.1: Castle Mill Student Accommodation Phase One Environmental Review, Frankham, July 2011;
- Appendix 10.2: Report On A Ground Investigation at Castle Mill Oxford, ESG, October 2011; and
- Appendix 10.3: Contaminated Land Generic Risk Assessment, ESG, November 2011.

- Option 3 - present a pre-commencement baseline, describe how that changed across the years before providing a new post-remedial / "residual" baseline with a current conceptual model, and risk assessments adopting an EIA methodology to prove that residual environmental risks are acceptably low, that the site is now fit for its current use (based on all the evidence available and making assumptions about the ongoing groundwater monitoring), and that the development has had adverse or beneficial impacts.

Without such a statement some readers may be confused and conclude that the chapter is rather unorthodox.

Section 1.3.3 of ES Chapter 1 suggests that the EIA Co-ordinator expected the third option, as Chapters are expected to cover:

- the scope and methods used;
- baseline (pre-development) environmental conditions;
- the environmental impacts of development, i.e. *post-development environmental conditions compared with pre-development conditions*;
- the measures proposed to mitigate these effects (including those already provided and any new mitigation measures identified as necessary);
- the residual effects of development (taking account of all proposed mitigation);
- impact interactions (between topics) and where relevant cumulative effects; and
- a summary.

At present Chapter 10 is closest to Option 3.

Beyond the Introduction, the ES chapter which spends twelve pages setting out:

- relevant legislation and legal definitions;
- national and local planning policy;
- risk based methods of assessment[2]; and
- tables establishing criteria for receptor sensitivity, magnitude of impact and significance[3]
- before committing less than three pages to the baseline, half a page on impact assessment and a page on mitigation before launching into almost three pages on the construction-stage diesel spill, returning to mitigation and covering that and residual & cumulative effects in less than two pages before summarising.

10.2 Scope and Methodology

Whist there is extensive discussion of the EIA methodology to be adopted; the Chapter at no point truly deploys that methodology. Limited use is made of Criteria for Assessing Receptor Sensitivity as set out in Table 10.1 of the Chapter[4] but, given Section 1.3.3 of ES Chapter 1, SLR would have expected the EIA Chapter to clearly present either:

[2] *without* referencing key guidance such as the Model Procedures for the Management of Land Contamination or guidance by the or the Construction Industry Research and Information Association – see **Infobox 1**

[3] *without* mention of their source or reference to technical guidance commonly adopted by EIA practitioners such as that produced by the Institute of Environmental Management and Assessment or the Highways Agency – see **Infobox 2**

[4] e.g. the site *"is considered to have been of a 'medium' environmental sensitivity"* and *"the closest surface water feature...is considered to be of moderate to high environmental sensitivity"*

- a pre-commencement baseline, describe how that changed across the years before providing a new post-remedial / "residual" baseline with a current conceptual model; or at least
- a new post-remedial / "residual" baseline with a current conceptual model.

If the authors had set out a post-remedial conceptual site model they could have followed the EIA methodology set out in Section 10.2. After listing and detailing:

- potential or known contaminant sources;
- receptors and their sensitivity (using Table 10.1); and
- potential pollutant linkages (PPL)

the author could have:

- determined the magnitude of the potential impact of each PPL (using Table 10.2),
- considered the temporal nature of the impact and the geographic scope of the impact (using Section 10.2.12); and finally
- made use of the significance matrix (Table 10.3) to either: a) determine those PPL requiring further action[5]; or b) demonstrate to the reader that remedial works have achieved their goal and that the development has brought about environmental benefits.

An example of the type of EIA output one might expect is provided below.

Contaminant Source / Source of Effect	Receptor	Risk (General Qualitative Risk Assessment using CIRIA 552 Method)	Potential Significance and Nature of the Effect	Mitigation	Residual Risk	Residual Significance and Nature of the Effect
Inorganic and organic contaminants in Made Ground & dissolved in groundwater	Controlled Waters: groundwater within Secondary Aquifer	Low	Non-significant adverse, direct, temporary, short term and reversible.	Selectively segregate contaminated Made ground and place below hardstanding and have soakaways installed in 'clean' ground.	Moderate positive	**Significant beneficial**, direct, long term, temporary, and reversible.

Chapter 10 really makes no use of Section 10.2 "Scope and Methodology", and in doing so is little more than a project description which references the reports and describes what has been done from project inception to present day.

SLR is not suggesting that the technical assessment and remedial work implemented before or during the development was inappropriate or will have failed to produce a site suitably fit for its use[6], but SLR is reporting that Chapter 10 could be confusing to some readers and does not conform to what most professionals would perceive as an ES chapter.

[5] PPLs arising from the construction-stage diesel spill are still subject to "action" – groundwater monitoring is ongoing until spring 2015.

[6] The chapter cites the various local authority and Environment Agency inputs concerning contamination and is very clear in its message that the site has been made suitable for its use and cannot be classified as contaminated land under Part 2A of the Environment Protection Act 1990.

It would be more usual, for instance, to set out the baseline, form conceptual site models for the various project stages (pre-commencement, construction, operation) and to present a logical series of risk assessments addressing:

- the potential harm potential or proven historic contaminants and pollutants in the baseline could have on pre-commencement human receptors and the wider environment;
- the potential impact that the construction activities and / or fabric of the development, without mitigation, could have on baseline soil / land quality or ground-based resources*;
- the potential harm and damage potential or proven historic contaminants and pollutants could inflict on the fabric of the development, the human receptors introduced by the developer and the wider environment both during construction and whilst in operation (i.e. in occupation); all considering
- the magnitude of the impacts, their longevity (short term to permanent ~ acute to chronic), the nature of the effects (direct/indirect, cumulative, negative/beneficial, etc.) and their significance and mitigation requirements.

*Chapter 10 does not consider, for example, the potential for development to have:

- damaged or destroyed a Site of Special Scientific Interest protected by law to conserve a geological asset;
- removed access to a mineral resource (e.g. clay, gravel, coal, etc.); or
- damaged or removed a topsoil resources (via disaggregation, compaction or sealing), etc.

so the EIA reader interested in the development's impact does not know whether the impact on ground resources is negligible or not. This may not be critical given the retrospective nature of this EIA.

Some "geo-environment" chapters would also discuss the layout of the development and consider whether certain options present higher risks or require extra mitigation (which could happen, for instance, if one development layout proposed a garden over a contaminated area and another didn't). Chapter 10 does not consider any layout options, it simply describes the development as:

"The Castle Mill Phase 2 development comprises the construction of eight four- to five-storey buildings, comprising 312 units of postgraduate student accommodation for the University of Oxford. The site includes associated areas of soft and hard landscaping".

10.3 Summary

The ES has recognised that the assessments within an EIA commonly go beyond those delivered in support of a standard planning application as the Chapter sets out an EIA methodology. Having set out a suitable methodology, and despite providing an exceedingly useful commentary on the entire "land quality story" from 2011, the Chapter fails to fully utilise the available information within that EIA methodology. Had the methodology been deployed the ES would have categorised impacts by their significance, which in turn would enable a clear / measurable comparison of post-development environmental conditions compared with pre-development conditions (as required by Section 1.3.3 of ES Chapter 1), something which could usefully set out how the development has resulted, for instance, in minor, moderate or major benefits. The logical application of the methodology may well have been able to support a conclusion that this development, despite having its own pollution incident, has brought former railway land which was contaminated to some degree back into beneficial use.

With some modification, the chapter will conform to common EIA practice, the expectations of Section 1.3.3 of ES Chapter 1 and the demands of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

Infobox 1 – Contaminated Land Risk Assessment

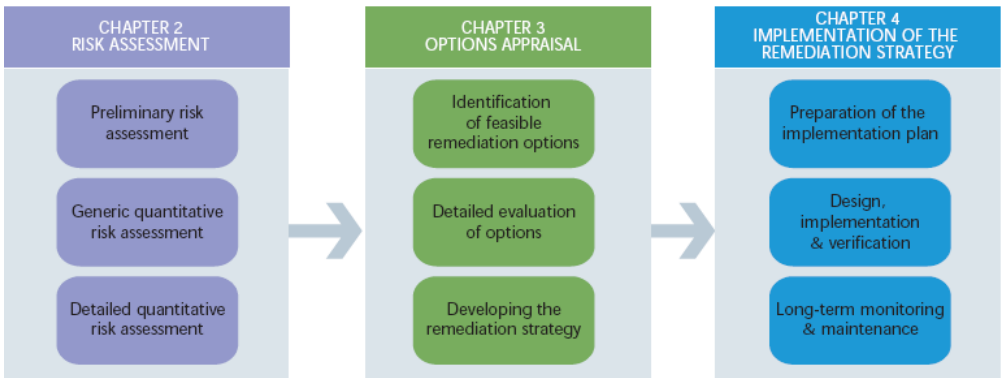
In terms of assessing risk from contaminated land the overarching guidance document is the Environment Agency's Model Procedures for the Management of Land Contamination, Contaminated Land Report 11 (CLR11) dated 2004. This provides a useful risk based evidence approach for determining whether effects are significant or not. However, it is important to note that there is no commonly accepted guidance within CLR11 or on how practitioners should utilise the CLR11 risk assessment approach in EIA. Therefore, the EIA author needs to adopt the method prescribed in CLR11 and use a Conceptual Site Model to drive risk assessments and then apply logic to generate the required EIA outputs.

The CLR11 Model Procedures are intended to assist all those involved in dealing with land contamination, including landowners, developers, professional advisors, regulatory bodies and financial providers. The technical approach presented in the Model Procedures is designed to be applicable to a range of non-regulatory and regulatory contexts that includes:

- development or redevelopment of land under the planning regime;
- regulatory intervention under Part 2A of the Environment Protection Act 1990;
- voluntary investigation and remediation; and
- managing potential liabilities of those responsible for individual sites or a portfolio of sites.

The Model Procedures are split into three stages: risk assessment, options appraisal and remediation. Each stage can be sub-divided as shown below:

Extract from CLR 11



The first stage, Risk Assessment, is an essential component in achieving effective management of the risks from land contamination. Risk assessment for chemical contamination can be a highly detailed process as there are a range of specific technical approaches for different contaminants and circumstances. As shown above, the risk assessment stage is itself subdivided or tiered; assessors apply each tier in turn. Higher tiers require the assessment of more detailed information.

The common approach used by practitioners to assess the effects of development at a site on the site's geology and land quality directly (through changes to ground conditions as a result of development) and the indirect effects of those changes on the ultimate end users of the land. To enable this assessment there are firstly two risk assessments that are undertaken:

- a *Development Impact Assessment* discusses the potential impacts of the proposed development via loss (removal, erosion, disaggregation or compaction) and pollution. The assessment considers impacts during construction and operation of the development.
- a *Land Quality Assessment* of the chemical quality risks posed by the site:

Infobox 1 – Contaminated Land Risk Assessment

- during the construction phase to construction workers, and controlled waters; and;
- the risks of chemical exposure to human future site end-users and controlled water receptors from the period following completion of construction, taking into account the change in the land use brought about by the development.

Where there is a historic contaminated land risk at a site, a Conceptual Site Model (CSM) of the development site is prepared.

Potential land contamination impacts and associated risks to human health and controlled waters are assessed using a methodology based upon the CIRIA C552 Contaminated Land Risk Assessment – A Guide to Good Practice document (CIRIA, 2001). This method is specifically tailored to assess the impacts and risks that may arise from exposure to ground contamination and ground gases.

The CIRIA C522 guidance provides a description regarding the risk categories resulting from the application of the methodology, as summarised in the table below. It is considered that any moderate or higher risks are considered to be potentially significant in terms of the EIA Regulations as these are likely to require further investigation, remediation or other mitigate in order to reduce risks to acceptable levels.

Significance of Generic Qualitative Risk Assessment Categories

Conceptual Site Model Risk Level	Description	Significant/Not significant
Very High Risk	There is a high probability that severe harm could arise or there is evidence that severe harm is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not already undertaken) is required and remediation is likely to be required.	Would be classified as Category 1 or 2 site according to the Part 2A of the Environment Protection Act 1990. Significant.
High Risk	Harm is likely to arise and realisation of the risk is likely to present a substantial liability. Urgent investigation (if not already undertaken) is required and remediation may be necessary in the short term and is likely to be required over the longer term.	Category 1 or 2 site. Significant.
Moderate Risk	It is possible that harm could arise. However, it is either relatively unlikely that harm would be severe or if harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.	Category 2 or 3 site. Significant.
Low Risk	It is possible that harm could arise but it is likely that this harm would at worst normally be mild.	Category 3 site. Not significant.
Very Low Risk	There is a low probability that harm could arise. In the event of such harm it is not likely to be severe	Category 4 site. Not significant.

Note besides saying “Not significant” and “Significant” this table includes land categories

Infobox 1 – Contaminated Land Risk Assessment

which came about in spring 2012. That time saw substantial changes in the UK's Contaminated Land Regime with a complete overhaul of the legal guidance[7] and deletion of long-standing pollution control policies[8] in favour of the National Planning Policy Framework[9]. For clarity:

- Category 1: describes land which is clearly problematic;
- Categories 2 and 3: cover the less straightforward land where detailed consideration is needed before deciding whether it is Category 2 (contaminated land requiring remedial action) or Category 3 (not contaminated land) - wider socio-economic factors come into play if health risks assessment fails to produce a decision; and
- Category 4: describes land that is clearly not contaminated land.

The new Category 4 test is particularly important in defining when land is clearly not contaminated land in the legal sense; it introduces the idea that it would be exceptional for land: exhibiting normal background levels of contamination; or contaminant levels below published assessment criteria (which are due to be augmented by new screening concentrations / tools[10]) to be considered as contaminated land.

Importantly, the new guidance makes it clear that regulators can only require remediation to a point where land is no longer contaminated land in the legal sense (i.e. the boundary between Categories 2 and 3) and not require *"unnecessary"* clean up to attain Category 4 standards. This means some landowners / developers will choose a remedial end-point in Category 3 whilst others will still volunteer to clean-up to Category 4 (to deal with perception issues or to please funders, etc.).

Infobox 2

Guidance for Environmental Impact Assessment by IEMA in 2006 provides general advice on how to undertake an EIA.

EIA guidance has also been published by the Highways Agency in the Design Manual for Roads and Bridges (DMRB), Volume 11 Environmental Assessment, Section 3, Part 11, Geology and Soils (Highways Agency, 1993) for assessing the geology and soils effects of highways schemes. However, the guidance is not particularly prescriptive on how a practitioner should determine the magnitude of impacts/change and the significance of effects. However, the DMRB, Volume 11 Environmental Assessment, Section 2, Part 5, HA205/08 Assessment and Management of Environmental Effects Highways Agency (Highways Agency, 2008) does provide a commonly used framework for assessing effects using a matrix approach. This can certainly be applied in a "geo-environmental" chapter, except for the assessment of contaminated land risks which are best dealt with by guidance from Infobox 1.

[7] Environmental Protection Act 1990 Part 2A Contaminated Land Statutory Guidance, Defra, April 2012.
[8] Planning Policy Statement 23: Planning and Pollution Control, ODPM, November 2004.
[9] National Planning Policy Framework, DCLG, March 2012.
[10] Provisional Category 4 Screening Levels were announced in May 2013

Infobox 3

Appendices 10.4 to 10.7 post-date the 2011 planning application. They:

- concern ground and groundwater conditions following stabilisation/remediation of Made Ground and clay layers below the footprint of the building plots by a firm called Cognition Land & Water to facilitate construction of raft foundations (Appendix 10.4);
- present a more detailed assessment of groundwater risks to supplement the earlier generic assessments (Appendix 10.5);
- set out to verify that the initial phase of a remedial strategy of providing a 300mm to 600mm thick clean soil cap with geotextile marker layer had been implemented, and that soil and groundwater removed from an excavation to "chase out" diesel spilt by contractors was adequate in removing the bulk of that source (Appendix 10.6); and
- set out to verify that the later stages of remedial capping and set out proposal for an indoor vapour monitoring programme checking for volatile hydrocarbons from the split diesel (Appendix 10.7).

Appendices 10.8 to 10.10, are dated 2013/14 and concern remedial works plus groundwater and hydrocarbon vapour monitoring tasks which arose from a significant diesel spill on site during the construction period, groundwater monitoring is in fact due to continue for a total of 18 months (until spring 2015).

Appendices 10.4 to 10.7 (2013) have been submitted to the planning authority to address Condition 16 which required the submission and approval of a soil and water contamination survey and risk assessment, as well as a validation report and completion certificate in relation to any remedial works[11]. Those four reports combined with Appendices 10.8 to 10.10 and any future reports regarding residual conditions, whilst useful in addressing the relevant planning condition and the developer's overall objective to demonstrate that the site is fit for its residential use, concern activities that would not generally feature in a pre-development ES – they cover activities which require documentation after consent is granted and both during and after remedial/mitigation works.

Given that information in Appendices 10.4 to 10.10 only became available after the application and after construction / remediation activities began it would not be normal for it to inform a normal pre-development ES chapter – the raison d'être for the EIA is to look, predicatively, at the future construction and operation stages.

[11] Chapter 10 states that Appendices 10.3 to 10.7 were submitted against Condition 16 and that *"The officer's report to the Council's West Area Planning Committee in September 2013 recommended approval of the submitted documents and discharge of condition 16 (see ES Appendix 1.2), but the decision on this and other conditions was deferred and the condition remains to be determined by the Council pending the submission of this ES (see Section 1.1)"*.

11.0 FLOOD RISK & DRAINAGE

11.1 Introduction

SLR has undertaken a review of the assessment of the impact of the development upon flood risk and drainage set out within the voluntary ES and its accompanying appendices and drawings.

This review has been focussed upon ES Chapter 11 (Flood Risk and Drainage), and its supporting Flood Risk Assessment (FRA) presented as ES Appendix 11.1, and Drainage Strategy, Statement and Plans presented as ES Appendix 11.2.

The FRA dated August 2011 (presented as ES Appendix 11.1) was submitted with the planning application and was subsequently approved by or agreed with Oxford City Council (OCC) and the Environment Agency (EA) in 2012 prior to the preparation of the retrospective ES.

The Drainage Strategy, Statement and Plans dated September 2011 (presented as ES Appendix 11.2) were submitted in support of the planning application. Following numerous revisions, the Drainage Strategy, Statement and Plans were submitted to OCC in October 2012 to satisfy planning condition 15 pursuant to the planning permission and subsequently approved by or agreed with Oxford City Council (OCC) in November 2012 prior to the preparation of the retrospective ES.

Consideration of the assessment of the impact of the development upon groundwater has been covered within Section 10.0 (Geo-Environment) of this report in relation to potential risks associated with soil and groundwater contamination.

11.2 Scope

The scope and content of ES Chapter 11 and its supporting appendices has considered flood risk, drainage, and water quality taking into account previous work undertaken to support the planning application and subsequent work undertaken to satisfy planning conditions pursuant to the planning approval. It has also been prepared to respond to issues raised during the consultation process.

ES Chapter 11 prepared in October 2014 draws upon information provided within the earlier documents described in Section 11.1 to inform its retrospective assessment of the impact of the development upon flood risk and drainage.

The FRA that informs ES Chapter 11 was prepared in early August 2011 prior to the implementation of the EIA Regulations later that month. Prior to the EIA Regulations, matters to be considered for inclusion within an ES were typically scoped from a checklist set out within DCLG's EIA Guide to Procedures (2000) Appendix 5. When considering effects upon water for inland sites, the checklist indicated the following suggested content:

- Identify water features (watercourses, aquifers *etc.*) and details of existing discharges;
- Consider effects of development on drainage patterns in the area;
- Consider changes to other hydrographic characteristics, *e.g.* groundwater level, watercourses, flow of underground water;
- Consider effects of pollutants, waste *etc.* on water quality.

The content of ES Chapter 11 covers the majority of the above matters that would have formed the basis of an ES chapter had it been prepared concurrently with the FRA.

The content of ES Chapter 11 includes the subject matter that would reasonably be expected to be covered within an ES for a site in an area of low fluvial flooding potential, incorporating residential development which, by its nature, does not include processes which would adversely affect water quality.

A summary of data sources used to inform the retrospective assessment has been provided, along with a summary of legislation, policy and guidance relevant at the time of, and subsequent to, the planning application.

A summary of hydrological receptors and baseline hydrological conditions has been set out, and an impact assessment of effects upon flood risk, drainage and water quality provided for both the construction and operational phases of the development. Mitigation measures proposed as part of the FRA and Drainage Strategy have been presented, along with an assessment of residual and cumulative effects.

ES Chapter 11 reasonably and correctly considers indirect impacts upon water quality (both surface water and groundwater receptors) from surface water. Direct impacts upon groundwater quality, and indirect impacts from contaminated soils and groundwater upon surface water receptors has reasonably and correctly been considered within ES Chapter 10.

11.3 Methodology

ES Chapter

ES Chapter 11 has been prepared within the spirit of the EIA Regulations as the assessment focuses on those aspects that are likely to give rise to significant effects. At the pre-application stage, likely significant effects of the development were identified as flood risk to the development itself; and increased flood risk elsewhere as a result of on-site works and potential increases in surface water runoff from an uplift in impermeable coverage. These likely significant effects have been considered within the FRA that supported the planning application, based largely upon professional judgement.

ES Chapter 11 provides a robust template for assessment of effects, however, no clear assessment has been made as to the magnitude and potential level of effect, nor the likelihood and potential significance of effects. Consideration has been given to the permanence, or otherwise, of effects by assessing potential effects for both the construction and operational phases of the development.

Flood Risk Assessment

The methodology adopted for the FRA closely follows guidance set out within the Flood Risk Assessment Checklist that formed Appendix B of PPS25 Practice Guide (Update December 2009) as referenced within paragraph 1.2.1 of Appendix 11.1. The approach to the FRA has, therefore, followed industry best practice, guidance and national policy relevant at the time of the planning application.

Drainage Strategy

The methodology adopted for the assessment of drainage closely follows guidance set out within Annex F of PPS25 relating to managing surface water and takes due regard of supplementary guidance provided by the EA (SuDS – A Practical Guide, 2006) as referred to

within paragraph 1.0 of Appendix 11.2. The approach to the Drainage Strategy has, therefore, followed national policy and guidance relevant at the time of the planning application.

Whilst the supplementary EA guidance industry was a recognised reference source, industry best practice at the time of the application was generally considered to have been CIRIA 697 The SuDS Manual (2007). CIRIA 697 methodology does, however, appear to have been followed in relation to greenfield runoff calculations, as set out in paragraph 4.4.1 of Appendix 11.1 which informs the Drainage Strategy.

11.4 Baseline Conditions

From a review of ES Chapter 11 and its supporting appendices, SLR has deemed that baseline conditions relating to drainage were deemed to be consistent, correct and reliable.

SLR has, however, identified the following areas of weakness, omissions, and inconsistencies within the evidence base and assessment relating to flood risk and water quality. References to relevant documents and paragraphs have been provided for clarity, where appropriate.

Policy and Guidance

PPS25 Practice Guide was replaced by Planning Practice Guidance in March 2014 and, as such, no longer remains a valid reference source [ES 11.2.11]. In the context of the ES this is not deemed to pose a material impact upon the validity of the assessment.

Baseline Data

The Strategic Flood Risk Assessment (SFRA) for Oxford City Council (2008) was replaced by a subsequent update, namely the SFRA Final Report in March 2011 and, as such, no longer remains a valid reference source. Data and mapping accompanying the 2011 report should have been used to inform the FRA [ES 11.2.23 and FRA 2.3.3].

Flood level data provided by the EA for the 1 in 100 year fluvial event has been stated within the documents [ES 11.3.6 and FRA 11.0], however, no evidence has been provided to verify the source of the data, the date of issue, or the hydraulic modelling techniques deployed to establish the data.

No site specific detailed flood information, provided directly from the EA, has been appended to the FRA. Typically, detailed flood modelling data would be provided by the EA, upon request, for a suite of return period flood events, thereby allowing climate change impacts upon present day flood levels to be quantified [ES 11.3.6 and FRA 5.1] and to more reliably inform the evolution of flood mitigation measures [ES 11.5.3 and FRA 11.0].

Confirmation has been provided of the site being affected by historic fluvial flooding [FRA 3.1.2] based upon mapping provided in Appendix B of the FRA. Typically, estimated or recorded historic flood level data would be provided by the EA, upon request, to more reliably inform the definition of flood hazard and the evolution of flood mitigation measures [ES 11.5.3 and FRA 11.0].

Confirmation has been provided of the site being highly susceptible to groundwater flooding [FRA 3.1.5] based upon mapping provided by the British Geological Survey. Typically, long-term historic groundwater level and quality data would be provided by the EA, upon request, to more reliably inform the definition of flood hazard, the evolution of flood mitigation

measures [ES 11.5.3 and FRA 11.0] and the surface water drainage strategy [ES 11.5.4 and Appendix 11.2].

No specific data has been appended to the ES Chapter 11 in relation to local current surface water quality, such as River Quality Objectives for the local Main Rivers. Typically, suitable data can be gathered from the EA website or from River Basin Management Plans (freely available within the public domain) thereby allowing the baseline sensitivity of local hydrological receptors to be quantified and potential effects ascertained [ES 11.3 and 11.4.8] and to more reliably inform the evolution of water quality mitigation measures and residual effects [ES 11.5.5 and 11.6.3].

Summary of Baseline Conditions

SLR has assessed the representation of baseline conditions within ES Chapter 11 to be fair, taking into account the nature of the development and its hydrological setting. Baseline conditions provide adequate coverage of the correct subject matter albeit with some potential deficiencies within the baseline data.

11.5 Impact Assessment

From a review of ES Chapter 11 and its supporting appendices, the impact assessment of effects during the construction phase was deemed to be consistent, correct and reliable based upon the proposed implementation of temporary surface water drainage measures as part of site preparation, and good site practices.

SLR has, however, identified the following areas of weakness, omissions, and inconsistencies within the impact assessment of effects during the operational phase relating to flood risk, drainage and water quality. References to relevant documents and paragraphs have been provided for clarity, where appropriate.

ES Methodology

ES Chapter 11 provides a robust template for assessment of effects, however, no clear assessment has been made as to the magnitude and potential level of effect, or the likelihood and potential significance of effects with which to inform the evolution of avoidance or mitigation measures.

Assessment of potential effects during the construction phase have been covered [ES 11.4.1 – 11.4.5] and evidence is provided of the implementation of temporary surface water drainage measures as part of site preparation, and good site practices. Effects have, however, been reported for the actual construction period, rather than provision of an assessment of potential effects that could be reasonably anticipated during any construction period.

Flood Risk Assessment

Whilst the site itself is shown to be at low risk of fluvial flooding, flood mapping provided within the FRA [FRA Appendix B and C] indicates that sections of off-site highways to the south of the site (including Roger Dudman Way, Cripley Road, and Botley Road, Mill Street) are predicted to be at high risk of flooding from fluvial and / or surface water. However, no evidence has been provided to establish that future site users would be afforded safe access and egress during flood conditions.

Confirmation has been provided of the site being at risk of flooding from surface water [FRA 3.1.4] for higher magnitude rainfall events. However, no assessment of the significance or

likelihood of occurrence of surface water flooding has been undertaken to more reliably define potential overland flood flow pathways and to gauge whether additional surface water runoff would need to be allowed for within the on-site surface water drainage arrangements. In turn, this element of the impact assessment has not informed the evolution of flood mitigation measures [ES 11.5.3 and FRA 11.0] and the surface water drainage strategy [ES 11.5.4 and Appendix 11.2].

Confirmation has been provided of the site being highly susceptible to groundwater flooding [FRA 3.1.5] based upon mapping provided by the British Geological Survey. However, no assessment of the significance or likelihood of occurrence of groundwater flooding has been undertaken to more reliably inform the impact of the flood hazard, the evolution of flood mitigation measures [ES 11.5.3 and FRA 11.0] and the surface water drainage strategy [ES 11.5.4 and Appendix 11.2].

Confirmation has been provided within ES Chapter 11 that the surface water drainage outfall from the site may be reliant upon a pumped outfall arrangement [ES 11.3.9]. However, no assessment has been made of the flood risk impact upon the development from failure of the drainage infrastructure (either by pump failure, blockage, or power outage) which would typically require hydraulic simulation of a design rainfall event entering the proposed drainage system with a zero discharge outlet. In turn, this element of the impact assessment has not informed the evolution of flood mitigation measures [ES 11.5.3 and FRA 11.0] and the surface water drainage strategy [ES 11.5.4 and Appendix 11.2].

Drainage Strategy

References are made within the supporting appendices that the surface water drainage outfall from the site may be hindered by high downstream water levels within the receiving watercourse [Appendix 11.2 4.2 and 4.3]. However, no assessment has been made of the river-locking effect upon the site's drainage outfall, or from reverse flows from the river entering the on-site drainage network and attenuation. In turn, this element of the impact assessment has not informed the evolution of the surface water drainage strategy [ES 11.5.4 and Appendix 11.2] and, in particular, the robust sizing of the surface water attenuation features. Surface water drainage calculations [FRA Appendix D and Appendix 11.2 Appendix B] provide no evidence of analysis of surcharged outfall conditions, nor zero discharge conditions.

Summary of Impact Assessment

SLR has assessed the representation of the impact assessment within ES Chapter 11 to be appropriate for the construction phase and fair for the operational phase, taking into account the nature of the development and its hydrological setting. The impact assessment provides adequate coverage of the correct generic subject matter albeit with some potential deficiencies within the assessment of indirect sources of flood risk.

11.6 Mitigation Measures

Proposed Mitigation Measures

A summary of proposed mitigation measures is set out below:

- Proposed flood risk mitigation comprises of the elevation of development platform levels and finished floor levels of buildings above predicted fluvial flood levels. No flood risk management or resilience measures were deemed to be necessary;
- Sustainable drainage techniques comprising underground attenuation storage tanks and tanked granular storage media beneath porous paving, with associated flow

control arrangements to release flows in a controlled manner to the Castle Mill Stream;

- Provision of an appropriate management train of sustainable drainage components to mitigate the pollution risks from the site;
- Discharge of foul sewage to public sewer.

Review of Flood Risk Mitigation

Proposed finished floor levels have been set 600mm above the 1 in 100 year fluvial flood level [FRA 11.0]. However, no evidence has been provided to confirm the amount of freeboard (factor of safety) provided between the finished floor level and the 1 in 100 year fluvial flood level taking into account climate change effects over the anticipated 100 year lifetime of the development. Typically, flood level data incorporating climate change data would be used to more reliably inform the evolution of flood mitigation measures.

Confirmation has been provided of finished floor levels, however, no confirmation has been made of the level differential to be maintained between finished floor level and external ground levels. Typically, 150mm – 300mm differential is provided to allow potential overland flood flow routes to be routed around buildings.

Review of Drainage Mitigation

Surface water attenuation storage volumes have been established based upon unsurcharged outfall conditions. No assessment has been made of the river-locking effect upon the site's drainage outfall, or from potential reverse flows from the river entering the on-site drainage network and attenuation. Surface water drainage calculations [FRA Appendix D and Appendix 11.2 Appendix B] provide no evidence of analysis of surcharged outfall conditions, nor zero discharge conditions. As a result, the proposed quantum of surface water attenuation may not be sufficient to manage development runoff.

Surface water attenuation storage volumes have been established based upon Flood Studies Report rainfall profiles. Typically, best practice advocates that Flood Estimation Handbook rainfall profiles should be used in the derivation of the required quantum of surface water attenuation; these typically generate a greater volume of rainfall for any given return period rainfall event. As a result, the proposed quantum of surface water attenuation may not be sufficient to manage development runoff.

Surface water drainage calculations [FRA Appendix D and Appendix 11.2 Appendix B] provide no evidence of analysis of extended duration rainfall events; the longest storm duration considered has been a 6 hour storm event. Typically, best practice seeks consideration of storm events of up to 24 hour duration for sizing of attenuation storage arrangements with heavily restricted outlet discharge rates. As a result, the proposed quantum of surface water attenuation may not be sufficient to manage development runoff.

Proposed tanking of the granular storage media beneath porous paving indicates that due regard has been taken to minimising the migration of pollutants from the underlying ground, and due account has been taken of the potential effects of high groundwater levels. Ingress of groundwater into untanked permeable storage media could significantly reduce the available quantum of attenuation storage available at the onset of a rainfall event.

Retrospective Mitigation Measures

Within the DMS [ES Appendix 7.2] potential mitigation measures have been retrospectively proposed by OU. Appendix A of the DMS considers provision of tree planting and a badger run along the western site boundary. Based upon the Badger Run / Tree Detail proposed

ground levels along the tree planting / badger run are elevated above existing ground levels, formed by provision of a low retaining wall and fill material.

As a result of the land raising, fluvial flood storage is predicted to be displaced thereby generating a (albeit minor) potential uplift in fluvial flood levels elsewhere. Further assessment would be required to quantify the effect of the flood storage displacement and the need for compensatory flood storage to be provided to offset negative effects.

Other proposed retrospective mitigation measures presented within the DMS [ES Appendix 7.2] are deemed to have no material effect upon flood risk and drainage.

Summary of Mitigation Measures

All proposed mitigation measures are deemed necessary to eliminate or reduce potential negative effects upon flood risk and drainage. Proposed measures are deliverable and feasible to construct, and provide appropriate forms of mitigation.

Future impacts arising from implementing of retrospective mitigation measures have not been considered as part of ES Chapter 11 and may require additional mitigation or evolution of alternative options if taken forward.

11.7 Residual Effects

From a review of ES Chapter 11 and its supporting appendices, the assessment of residual effects was deemed to be consistent, correct and reliable on water quality and foul drainage matters.

SLR has, however, identified the following areas of weakness, omissions, and inconsistencies within the assessment of residual effects post-mitigation. References to relevant documents and paragraphs have been provided for clarity, where appropriate.

Flood Risk

Over the lifetime of the development, climate change effects could potentially compromise the amount of freeboard (factor of safety) provided between the finished floor level of buildings and the 1 in 100 year fluvial flood level. In the absence of evidence of climate change flood levels, it is not possible to state categorically that the development will remain at low risk of fluvial flooding throughout its lifetime and that the development will not increase flood risk to off-site areas over that period.

In the absence of a robust assessment of the significance or likelihood of occurrence of groundwater flooding, it is entirely reasonable for groundwater flooding to be presented as a residual flood risk [FRA 9.1.2]. No consideration of groundwater flooding as a residual effect has, however, been presented within ES Chapter 11 [ES 11.6.1], although this may reflect the findings of recent ground investigation works and associated groundwater monitoring.

Drainage

Controlled discharge of surface water runoff using sustainable drainage techniques (subsequently approved by the EA), taking due account of climate change impacts is expected to obviate residual effects on off-site flood risk over the lifetime of the development. Residual effects are, however, anticipated for storm events exceeding the drainage design criterion.

As a result of river-locking effects upon the site's drainage outfall, potential reverse flows from the river entering the on-site drainage network and attenuation, and the sizing of surface water attenuation being informed by superseded techniques, the proposed quantum of surface water attenuation may not be sufficient to manage development runoff to the standards advocated within the ES and off-site flood risk could be exacerbated.

No residual effects are anticipated in relation to foul drainage as Thames Water inherently accepts responsibility for negating off-site effect upon agreement to provide a sewer connection. Thames Water take on the responsibility for managing the additional foul flows within their sewerage system, providing strategic reinforcement where required to negate residual effects.

Water Quality

Land remediation and the removal of pathways for surface water through contaminated soils is expected to obviate residual effects on water quality over the lifetime of the development. In fact, beneficial residual effects are anticipated as a result of the development.

Retrospective Mitigation Measures

As a result of the proposed retrospective land raising associated with the proposed badger run and tree planting along the western site boundary, fluvial flood storage is predicted to be displaced thereby generating a (albeit minor) potential uplift in fluvial flood levels elsewhere.

Without further assessment and potential mitigation, the proposed retrospective mitigation measures are expected to result in a negative residual effect upon flood risk.

Summary of Residual Effects

SLR has assessed the representation of residual effects within ES Chapter 11 to be appropriate, taking into account the nature of the development and its hydrological setting. The assessment of residual effects provides adequate coverage of the correct generic subject matter albeit with some potential deficiencies within the assessment of indirect sources of flood risk and surface water drainage.

Furthermore, no clear assessment has been made as to the magnitude and potential level of residual effects identified.

Future impacts arising from implementing of retrospective mitigation measures have not been considered as part of ES Chapter 11 and may require additional mitigation or evolution of alternative options if taken forward.

11.8 Impact Interaction

From a review of ES Chapter 11 and its supporting appendices, the assessment of impact interaction was deemed to be unreliable on the interaction between groundwater and surface water. No other interactions are considered.

SLR has identified the following areas of weakness, omissions, and inconsistencies within the assessment of impact interaction. References to relevant documents and paragraphs have been provided for clarity, where appropriate.

Groundwater and Surface Water Interaction

ES Chapter 11 [ES 11.7.1 and 11.8.5] suggests that, as a result of the development, surrounding areas will be less likely to suffer from groundwater flooding as more surface water runoff will be directed into surface water bodies. Based upon information provided within the Geo-Environment Chapter [ES 10.3.7] clear reference is made to the groundwater being in hydraulic continuity with surface water in the area. It is not possible, therefore, to state categorically that groundwater flooding will be reduced as a result of the development; instead no effect is anticipated.

Interaction with Ecology and Archaeology

Fluctuation in groundwater or surface water levels as a result of the development has the potential to pose potential negative effects upon local ecological and archaeological receptors that are located within water-sensitive environs.

Whilst no reference to impact interaction upon ecology or archaeology is made within ES Chapter 11, based upon information provided within the Geo-Environment Chapter [ES 10.3.7] clear reference is made to the groundwater being in hydraulic continuity with surface water in the area. As a result, no effect is anticipated upon groundwater or surface water as a result of the development, in turn, no wider environmental effects are anticipated.

Interaction with Landscape

As a result of the proposed retrospective land raising associated with the proposed badger run and tree planting along the western site boundary, fluvial flood storage is predicted to be displaced thereby generating a (albeit minor) potential uplift in fluvial flood levels elsewhere.

Without further assessment and potential mitigation, the proposed retrospective mitigation measures are expected to result in a negative residual effect upon flood risk.

11.9 Summary

Summary of Findings

SLR has undertaken a review of the assessment of the impact of the development upon flood risk and drainage set out within the voluntary ES and its accompanying appendices and drawings.

The content of ES Chapter 11 includes the subject matter that would reasonably be expected to be covered within an ES for a site in an area of low fluvial flooding potential, incorporating residential development which, by its nature, does not include processes which would adversely affect water quality.

ES Chapter 11 has been prepared within the spirit of the EIA Regulations and provides a robust template for assessment of effects, however, no clear assessment has been made as to the magnitude and potential level of effect, nor the likelihood and potential significance of effects. Consideration has been given to the permanence, or otherwise, of effects by assessing potential effects for both the construction and operational phases of the development.

SLR has assessed the baseline conditions, impact assessment, mitigation measures, residual effects within ES Chapter 11 to be appropriate, taking into account the nature of the development and its hydrological setting. The assessment provides adequate coverage of the correct generic subject matter albeit with some potential deficiencies within all aspects of the assessment.

Future impacts arising from implementing of retrospective mitigation measures have not been considered as part of ES Chapter 11 and may require additional mitigation or evolution of alternative options if taken forward.

Whilst some notable deficiencies and omissions in the assessment have been identified, no significant effects have been identified that are anticipated to require material amendment to the proposed development.

Summary of Cumulative Issues

National planning policy and guidance on flood risk requires individual sites to pose no detrimental impact on flood risk elsewhere from any source. As a result, no cumulative effects relating to flood risk and surface water drainage are anticipated provided that potential future impacts arising from implementing of retrospective mitigation measures are mitigated if taken forward.

Thames Water inherently accept responsibility for negating off-site effect upon agreement to provide a sewer connection. Thames Water take on the responsibility for managing the additional foul flows within their sewerage system, providing strategic reinforcement where required to negate residual effects. As a result, no cumulative effects relating to foul drainage are anticipated.

Land remediation and the removal of pathways for surface water through contaminated soils is expected to provide beneficial residual effects on water quality as a result of the development. As a result, no negative cumulative effects relating to water quality are anticipated.

Soundness of the EIA in Flood Risk and Drainage terms

Whilst some notable deficiencies and omissions in the assessment have been identified, no significant effects have been identified that are anticipated to require material amendment to the proposed development.

No negative cumulative effects relating to flood risk, drainage, and water quality are anticipated.

On that basis, the ES is sound in flood risk and drainage terms.

12.0 TRANSPORT

12.1 Introduction

The application site is located adjacent to the railway at the northern end of Roger Dudman Way to the north west of Oxford city centre, approximately 530m north of Oxford Railway Station and the A420 Botley Road.

The development proposals, submitted by Oxford University in November 2011, were for the extension to the existing student accommodation at Castle Mill to provide additional 312 postgraduate units, with ancillary facilities, 360 covered cycle spaces and 3 car parking spaces. The application was permitted in February 2012. The development is now built with a total of 312 units and 456 beds spaces and has been occupied since September 2013.

The original application submitted in November 2011 was supported by a Highways Note dated 1 November 2011, the scope of which had been agreed with the highways officer at 'Oxford Council'. It was agreed that the scope of the Note would be limited to a description of the proposed access, parking and servicing arrangements along with a trip assessment. The Note concluded that *"it is not considered that the proposals are likely to have any implications in highways and transport terms"*. The decision letter dated 13 August 2012 included a total of three conditions relating to vehicle parking and cycle parking layout, parking control and restricted car ownership.

A further Highways Note dated 10th October 2013 was prepared as an update to the original; this presented a review of the proposals, which at that time were nearing completion, to ensure that the scheme complied with the findings set out within the original Highways Note. The scope of this second Highways Note included a review of the construction management, a description of the proposed access, parking and servicing arrangements and the environmental considerations in line with The 'Guidelines for the Environmental Assessment of Road Traffic' produced by the Institute of Environmental Management and Assessment (IEMA 1993). The conclusion of this note was that "*given that the scheme has been implemented in accordance with the approved permission, it is not considered that the occupation of the development will give rise to any material concerns or significant effects*".

An Environmental Statement (ES) has been prepared voluntarily by Nicholas Pearson Associates on behalf of Oxford University and was submitted to Oxford City Council on 30 October 2014. Oxford City Council has appointed SLR to complete a review of the ES and all supporting documentation. Chapter 12 of the ES assesses the transport effects of the development. This Transport Chapter and supporting appendices have been appraised against the standard assessment methods set out within 'Guidance for Transport Assessment' (DfT, 2007), the 'National Planning Practice Guidance' (NPPG) and the IEMA Guidelines. The findings are set out in this Section of the ES review.

12.2 Scope and Methodology

Section 12.2 of the ES provides a brief description of the transport related work undertaken in support of the application to date, and identifies that the original requirement for any transport considerations was discussed with the 'Highway Officer'. It was initially agreed that the likely limited impact from the proposals could see the transport and highways scope restricted to the local area. The updated Highways Note submitted in October 2013 subsequently included a review of the traffic related environmental effects. The ES transport chapter provides a summary of the findings from the previous Highways Notes and also considers the effects during the construction phase. Additionally the traffic impacts on Botley Road have been included along with a description of the ancient history of the local network.

It must be highlighted that the ES has been prepared to consider the potential impacts of three possible options that have been presented to mitigate the environmental impacts of the development, with the design mitigation measures in Option 1 proposed as the preferred solution. Each Chapter within the ES should include consideration of the changes that would result from these options, and the corresponding change to the impacts. This has not been done within Chapter 12. There has been no review of impacts for any other situation than that which exists.

Paragraph 12.2.5 refers to the baseline transport situation, as derived from traffic surveys undertaken in September 2013. The following paragraphs provide a description of the survey location, time and type of data collected, however at no point is there any reference to the results from the traffic surveys. It would appear that the traffic data collected has not been included for reference purposes; this exclusion means it is not possible to verify that the data collected is suitable for the purpose or in line with traffic flows anticipated in such a location.

The following paragraphs proceed to explain the IEMA Guidelines, with reference to the impact thresholds that would determine the need for more detailed assessment; a description of the environmental effects, the significance criteria and the magnitude of impact criteria is also provided. There is no discussion of the study area and any specific sensitivities that will see a lower threshold applied. It is here that the time periods are identified as Average Annual Daily Traffic (AADT), AM peak (08:00-09:00) and PM peak (17:00-18:00). The relevant policy and guidance documents are then discussed, with reference made to how the proposed development meets the policy objectives.

No reference has been made to the need for highway capacity assessments. While it is possible that the vehicle trips will not be large enough to justify any capacity assessments, the report should still include a review to confirm this requirement.

12.3 Baseline Conditions

This section of the chapter provides a description of the existing situation, with the highway network including Roger Dudman Way and Botley Road described. Table 4.6 provides the 'Baseline Link Flows'. In this section of the Chapter, as identified above, there is also no reference to the traffic survey results. The table gives flows for each of the time periods in 'All vehicles' and 'HGVs' for Roger Dudman Way and Botley Road. It is not possible to verify that the data included in the table is accurate to the data collected during the surveys. In addition, there is no detail provided to explain how the AADT flows have been obtained.

It is explained here that some construction activity is still taking place during the period of data collection which results in higher than normal HGV numbers on Roger Dudman Way. This seems to contradict the statement made earlier in paragraph 12.2.6 where it is mentioned that "*at this time the construction of the development was complete*". The results from the traffic survey would have provided further clarification of this situation.

The cycle and pedestrian facilities on Roger Dudman Way and Botley Road are described and reference is made to pedestrian survey data and cycle survey results, with flow data provided. Again, it is not possible to verify the figures quoted as the survey results have not been included for reference purposes.

The final paragraphs of this section make reference to the injury accident record. A very brief description of the accident data is provided to include the period of time covered by the analysis, the number of accidents, the severity, weather and light conditions and mode of transport. It is not clear where on the network the accident data relates to and no reference is made to the specific location of the accidents. The raw accident data has not been included and so no confirmation can be made.

Paragraph 12.3.22 states that there is a higher than expected level of cycle accidents, but the section then goes on to state that "*the level of cycle movements from the developments is unlikely to result in a material increase in cycle accidents beyond the annual fluctuations*" and that "*it is considered that the proposals would not result in any material increase to the individual road user*". It is not clear how this conclusion has been reached, given the limited analysis of the accident data that has been presented in this section. Without the original accident data it is not possible to verify if the accident data is fully represented in the description provided and if the conclusions reached are accurate.

12.4 Impact Assessment

This section of the Chapter includes a retrospective description of the impacts during construction; a Traffic Management Plan Checklist has been included in Appendix 12.2. Paragraphs 12.4.1 through to 12.4.6 provide a brief description of the issues anticipated through the construction phase and the methods adopted to prevent any problems. There is no significant detail included and no reference has been made to the traffic management plan. It concludes that there were no reported traffic-related accidents during the construction period and that no complaints were received in relation to the construction activity. The second Highways Note (Oct 2013) included a section titled 'Construction Management Review' however there is no more detail provided here.

Paragraphs 12.4.7 to 12.4.12 provide a description of the operation at the site, with reference to the parking restrictions, available cycle parking and service arrangements. It is mentioned here that the development falls under the University's overarching Travel Plan, but no details have been included and the document has not been appended for reference purposes.

The effects during construction are discussed with reference made to Table 4.6 where the AADT figure of 23 HGVs on Roger Dudman Way is discussed. It is stated that this number of HGVs equates to 6.6% of the AADT flow of HGVs on Botley Road, and that as this is below the threshold of 30% no further assessment is required. As mentioned above, there has been no discussion of any sensitive areas where a threshold of 10% should be applied.

It has been highlighted above that paragraph 12.2.6 makes reference to the construction phase as being 'complete' during the period of traffic data collection. If this is the case, it is likely that the HGV flows provided in Table 4.6, and included in the review of the construction impacts, could be lower than the maximum HGV flows seen during the busiest period of construction; this would imply that the construction impact assessment is inaccurate

This section then continues to the impact assessment of the effects from the completed development. A number of tables are presented which set out the traffic data (all vehicles and HGVs) for the 'with' and 'without development' scenarios for the three time periods. As before, it is not clear how the AADT flows have been obtained and there is no reference to the traffic survey results. In addition there is no explanation of the origin of the development generated traffic.

To determine this it is necessary to refer back to the original Highways Note (dated Nov 2011). In Section 3.0 of the note the trip generation and mode split identified at the existing 127 units has been applied to the proposed number of units, with the exception of any trips that would be shared (postal, refuse collection etc.). The resulting trip information, referenced as 'proposed additional trips' is set out in table 3.2 where 35 trips have been identified; this would translate to a total of 70 movements which corresponds with table 12.7 in the ES Chapter. There is some concern that the inclusion of the 23 HGVs within the total vehicle count for the 'existing situation' on Roger Dudman Way may result in an underestimate of the potential percentage impact. If construction traffic has been included

within the base AADT flows, the relative increase in traffic resulting from the proposed development will have been understated.

The final paragraphs in this section state that Roger Dudman Way is to be included within the assessment, but as the impact of the proposals beyond Roger Dudman Way will fall significantly below the 10% threshold no additional assessment is to be included.

The remaining paragraphs in this section proceed to describe the effects of the proposals on the environmental criteria. Paragraph 12.4.23 advises that given the limited increase in traffic as a result of the proposals, the development will not give rise to any perceptible delay, further stating that this view is "*based on experience combined with on-site observations*". This statement is considered to be unsubstantiated as it has not been identified specifically how the 13% increase in traffic along Roger Dudman Way would not give rise to driver delay. It should be possible to use the traffic survey results to qualify this statement but this has not been done.

This section then goes on to discuss the effects on pedestrians and cyclists, first identifying the impacts of severance. The increase in traffic is referenced as being negligible, and that there is no need for pedestrians to cross Roger Dudman Way until they reach the southern section close to the railway. Pedestrian delay is then discussed, with the likely gaps in traffic flow identified. Paragraph 12.4.35 concludes "*that the tables identify that there will be a negligible effect to the ability to cross the carriageway as a result of the proposals*". No reference has been made to the increase in flow of pedestrians expected along Roger Dudman Way, information that would have informed the conclusions reached in this section.

The impact on the environmental effects of pedestrian amenity and fear and intimidation are then discussed, with no significant effect identified for each.

It should be noted that there has been little or no reference made to the impact on cyclists. With the expected increase of 156 cycles resulting from the proposed development the assessment is expected to include an analysis of the impact to cyclists as well as any impact resulting from the increase in cyclists (severance and pedestrian delay). The lack of reference to the existing cycle flows is also evident at this point.

12.5 Mitigation Measures

The mitigation measures referenced are the Construction Management Plan, Construction Travel Plan and the parking restrictions in place through the application of tenancy agreements. The Construction Management Plan and Travel Plan appear to have been suitable for purpose.

Reference to the University parking controls through the tenancy agreements has been included as a 'mitigation', the detail of which has been submitted to Oxford City Council for approval under planning conditions 9 and 10. Details of the tenancy agreement have not been included in this review.

The final paragraph identifies that the proposal is sustainable due to the proximity of the site to the railway station and local amenities, the high levels of cycle parking and the footpath/cycleway provided at the site. It is agreed that the site is sustainable, however with the concerns identified above in relation to the quality of the assessment, it should not be assumed that all possible impacts have been accurately identified.

12.6 Summary

SLR has raised a number of concerns with regard to the assessment and so the summary statement made, that the impacts of the development on transport and traffic are not considered to be significant, may not be accurate and cannot be verified by SLR. Further clarification and evidence will be required before the summary statement can be verified.

Section 3 of the IEMA Guidelines identifies that a wide range of factors can influence the impact of traffic including the volume of traffic, the speed of traffic and the composition of the traffic. In building the evidence to identify the environmental impacts the Guidelines set out the recommended stages to be followed, with the determination of existing and forecast traffic levels first in the list. Additionally the DfT guidance on Transport Assessment states that *baseline conditions need to be established accurately to understand fully the context of the development proposal*.

Chapter 12 of the ES states that traffic surveys have been undertaken, the results of these have not been provided and the discussion is considered to be limited. It has therefore not been possible to confirm that the traffic figures referenced are correct. Additionally there is no accident data provided and the analysis is also too brief. In light of these concerns it is considered that the conclusions made within this ES Chapter are not substantiated and attention is required to the following:

- Discussion and/or identification of any environmental sensitivities and the need to apply the lower 10% threshold;
- Consideration of the need for highway capacity analysis;
- Further detail provided in relation to the existing traffic and highway situation to include descriptions of the vehicle flows, pedestrian flows and cycle numbers. This should include the method used to determine the AADT flows as well as the original survey data;
- A thorough and detailed review of the safety situation to include the full accident data;
- Confirmation of the HGV numbers in both the baseline data and the proposed development assessment;
- A discussion of the University Travel Plan and how this would apply to the proposals as a mitigation measure;
- Inclusion of a more thorough and comprehensive impact assessment of the environmental criteria to include reference to the supporting evidence; and
- Assessment of the traffic and environmental impacts associated with three options as outlined in Chapter 4 of the Environmental Statement.

13.0 AIR QUALITY

13.1 Introduction

The Air Quality Environmental Impact Assessment (EIA) and associated Air Quality Technical Appendix for the Castle Mill Student Accommodation (Phase 2) was initially carried out in November 2013 and was subsequently updated in October 2014 for the inclusion of the on-site energy centre. This chapter contains a full review of the Air Quality EIA.

13.2 Methodology

Scope

The Air Quality Assessment focussed on the following four areas:

- the impact of dust generated by activities during the construction phase;
- the impact of emissions from additional vehicle movements;
- emissions from diesel trains; and
- emissions from the on-site energy centre.

There are no other activities associated with the development that have the potential to significantly impact on local air quality.

The methodology and guidance used for the assessment, including the Department for Environment, Food and Rural Affairs (DEFRA) technical guidance on Local Air Quality Management (LAQM.TG(09))[12], the Design Manual for Roads and Bridges (DMRB)[13] are the most relevant and suitable for these types of assessment. The guidance for the assessment of construction dust has been updated since the assessment was carried out. However, it is unlikely that use of the new guidance[14] would alter the findings of this assessment.

Receptors

The location of the proposed development is north-west of Oxford City centre adjacent to Oxford Meadows Special Area of Conservation (SAC). Apart from the future occupants of Castle Mill, the closest human receptors to the proposed development are those forming part of the Phase 1 Student Accommodation and properties located on William Lucy Way, located greater than 140 m from the proposed development.

In accordance with DEFRA technical guidance on LAQM.TG(09), all of these receptors have been considered in this assessment up to a suitable distance from the site boundary, as stated within the guidance documents.

Legislation, Policy and Guidance

This assessment considers all of the relevant legislation, national planning policies and guidance available at the time of carrying out the assessment including the air quality

12 Department for Environment, Food and Rural Affairs (DEFRA): Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(09), 2009.

13 Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, HA 207/07 - Air Quality, Highways Agency, 2007.

14 Institute of Air Quality Management (IAQM), Guidance on the assessment of dust from demolition and construction (2014).

objectives and critical loads / levels relevant for emissions of road traffic. Reference has also been made to the 2006 Oxford City Council (OCC) Air Quality Action Plan (AQAP). However, the 2013 AQAP has been released since the assessment was carried out with an overall objective to *"pursue the achievement of air quality standards and objectives across the city, and reduce carbon emission from transport activity".* In addition OCC has also developed a Low Emission Strategy for the city.

13.3 Baseline Conditions

OCC monitor concentrations of nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of less than 10µm (PM_{10}) and less than 2.5µm ($PM_{2.5}$) within its administrative boundary as part of their commitments to the LAQMe process. In addition background map concentrations covering the whole of the country are available from DEFRA.

A detailed review of the available monitoring data was been carried out as part of the assessment to determine current air quality concentrations at the proposed development. These data all indicate that existing air quality concentrations at the proposed development for NO_2, PM_{10} and $PM_{2.5}$ are likely to comply with the relevant air quality objectives. Since this assessment, the 2013 results have been made available within the OCC 2014 Air Quality Progress Report. This report indicates that there are no significant changes in the baseline air quality concentrations at the proposed development.

13.4 Impact Assessment

Construction Dust Impact

Construction phase dust impacts were assessed using the guidance available at the time of carrying out the assessment. This guidance has since been updated. However, it is unlikely that use of the new guidance would alter the findings of this assessment.

The assessment correctly identifies the closest sensitive receptors to the proposed development including the completed Phase 1 developments, the receptors on Venneit Close and William Lucy Way as well as Oxford Meadows SAC.

SLR agrees that using the available construction dust guidance the impact of earthworks, construction and trackout activities were identified as high at human receptors and low or negligible at Oxford Meadows SAC and these will be reduced to low with the mitigation measures in place.

Transport Related Emissions

Information regarding existing traffic movements was obtained from traffic counts, which indicated the average total vehicle movements were 579 per day, significantly less than the threshold required for any detailed assessment.

The traffic generated by the construction stage was likely to be less than 200 movements per day. Therefore, the assessment correctly concludes that the impact of vehicle movements associated with the construction stage of the proposed development is unlikely to have a significant impact on concentrations on Botley Road or Roger Dudman Way.

Given the development will only have three car parking spaces the assessment correctly concludes that the impact of vehicle movements associated with the operational stage of the proposed development will be negligible.

Impact of Train Movements

Using the LAQM guidance the assessment has correctly screened out the impact of train movements on the proposed development as the line has not been identified as having a high number of diesel locomotives and the background NO_2 concentration is estimated to be below 25 µg/m^3.

The proximity of the sidings to the proposed development presents a potential issue in relation to the short term SO_2 air quality objectives. However, to mitigate the noise impact of the sidings windows on the facade facing the sidings cannot be opened, implying that there will be no exposure to short term air quality concentrations within 15 metres of the sidings.

There is no reference to how these rooms will be ventilated in the absence of opening windows. Air would need to be drawn in from facades away from the railway sidings.

Impact of the Energy Centre

In compliance with the Clean Air Act, the stack associated with the energy centre is greater than 3 metres. The assessment also states that the stack complies with the Clean Air Act Memorandum. In addition, the report states that windows on the southern facade of the development will have non-opening windows to help protect from building downwash effects of emissions from the stack. However, no evidence of any screening assessment or emission parameters has been provided to support this assessment. In addition, Block 4 to the south of the stack, which has windows at a height of approximately 12 metres, has not been considered in this assessment.

The assessment concludes that the additional contribution of the energy centre emissions would not have a detrimental impact on local air quality. However, as no additional information has been provided it is not possible to support this conclusion.

SLR considers that quantification should be provided to support emissions from the energy centre being screened out from further assessment.

13.5 Mitigation Measures

Given the findings of the impact assessment, the mitigation measures considered in the assessment are considered to be acceptable.

13.6 Residual Effects

No evidence of any assessment of emissions from the energy centre is available to support the statement: *"the energy centre emissions would not have a detrimental impact on local air quality."*

SLR considers that quantification should be provided to support emissions from the energy centre being screened out from further assessment.

Given the findings of the impact assessment and proposed mitigation measures, the residual effects are considered to be acceptable.

All other stated residual effects, *i.e.* from construction and operational phases, are considered to be acceptable.

13.7 Impact Interaction

The cumulative effects section is considered to be acceptable.

13.8 Summary

No evidence of any assessment of emissions from the energy centre is available to support the statement: *"the energy centre emissions would not have a detrimental impact on local air quality."*

SLR considers that quantification should be provided to support emissions from the energy centre being screened out from further assessment.

Given the findings of the impact assessment and proposed mitigation measures, the residual effects are considered to be acceptable.

The remaining summary effect section is considered to be acceptable.

14.0 NOISE

14.1 Introduction

Within the *Introduction* section of the Noise Chapter it is clearly stated that the Chapter will assess the environmental impacts of the Phase 2 development with regards to noise.

14.2 Scope

The *Scope* of the Noise Chapter is set out in the *Introduction* section of the Chapter where it states at paragraph 14.1.5 that the effect of noise with regards to the following issues will be considered:

- *"The effect of noise from the railway on the proposed residential accommodation within the scheme itself;*
- *The impact of noise on existing residential premises in the immediate surrounding area from mechanical services plant associated with the scheme;*
- *Noise from road traffic associated with the scheme; and*
- *Any effects to the current noise climate in the immediate surrounding area due to the reflection of railway noise off the new building facades".*

Whilst it is appreciated that the ES has been submitted retrospectively and the development has already been built, the scope of the Noise Chapter should have included reference to the construction phase of the development. Within the scope it is logical that the effect of construction noise should be listed first.

Furthermore SLR considers that the effect of vibration from the railway upon the proposed residential accommodation should have been included in the scope of the Chapter.

Nevertheless, SLR considers that the *Scope* is clearly defined and is presented in a logical order.

14.3 Methodology

The methodology section of the Noise Chapter is split into four sub headings:

- Impact of Rail Noise on Proposed Residential Elements of the Scheme.
- Noise from Mechanical Services Plant.
- Noise from Road Traffic Associated with the Scheme.
- Effects to the Current Noise Climate in the Immediate Surrounding Area due to the Reflection of Railway Noise off the new Building Facades.

These four sub heading correlate with the four scoping bullet points and allow the reviewer to determine the methodology for each issue to be addressed within the Noise Chapter scope.

Under each sub heading the guidance to be referred to in each respective assessment is detailed. In the following text SLR will review the guidance used for each assessment.

Guidance Adopted

Impact of Rail Noise on Proposed Residential Elements of the Scheme

With reference to the *Impact of Rail Noise on Proposed Residential Elements of the Scheme*, the guidance discussed in the Noise Chapter is BS8233:2009 *Sound insulation and noise reduction for buildings - Code of practice*. This guidance was superseded by BS8233:2014 *Guidance on sound insulation and noise reduction for buildings* on the 28th February 2014.

It is appreciated by SLR that the building was constructed prior to the implementation of the new guidance, and consequently, the building was designed in order to demonstrate compliance with the internal ambient noise levels presented in BS8233:2009; noise levels to which the assessment subsequently refers.

No other guidance was referred to under the *Impact of Rail Noise on Proposed Residential Elements of the Scheme*. SLR considers that the following guidance should also have been referred to:

- The National Planning Policy Framework (2012).
- Adverse noise impacts are detailed in the Explanatory Note to the Noise Policy Statement for England (NPSE) which provides guidance on acceptable noise levels in society. The statement sets out the following three levels of '*effect*':
  - 'No Observed Effect Level' (NOEL). The NOEL is the noise level at which there is no adverse noise impact.
  - 'Lowest Observed Adverse Effect Level' (LOAEL). The LOAEL is the lowest noise level that an adverse noise impact will be detected.
  - 'Significant Observed Adverse Effect Level' (SOAEL). The SOAEL is the noise level at which there is a significant adverse effect upon health and quality of life.
- *Planning Practice Guidance (2014).* The section on noise includes a noise exposure hierarchy that includes the NOEL, LOAEL, and SOAEL; the effect levels described in the NPSE.

It is SLR's opinion that an appropriate NOEL, LOAEL, and SOAEL noise level should have been set for both the internal and the external noise environment at the proposed development site. The noise levels adopted should be justified and should be set with reference to relevant guidance which may include the following:

- BS8233:2014;
- The World Health Organisation's Guidelines for Community Noise; and, or
- The World Health Organisation's Night Noise Guideline's for Europe (2009).

Noise from Mechanical Services Plant

With reference to *Noise from Mechanical Services Plant*, the guidance discussed in the Noise Chapter is BS4142:1997 *Method for rating industrial noise affecting mixed residential and industrial areas.* At the time of writing the Chapter this was the correct guidance to use and it is suggested in the Nosie Chapter that the noise level of plant (installed at the development) should be "*designed to be at least 5dB below the measured background noise level…"*

BS4142:1997 was superseded by BS4142:2014 *Method for rating and assessing industrial and commercial sound* on the 31st October 2014. With regards to setting an appropriate rating noise level the new guidance states *"where the rating level does not exceed the*

background sound level, this is an indication of the specific sound source having a low impact, depending on the context." In SLR's opinion an acceptable rating noise level of new plant should be a limit no higher than the measured background noise level.

The noise level limit of "…*at least 5dB below the measured background noise level…"* quoted in the Noise Chapter, *with* the addition of a plus 5dB tonal penalty, would equate to a rating noise level equal to the background noise level. The proposed limit is therefore in compliance with BS4142:2014.

Noise from Road Traffic Associated with the Scheme

With reference to noise from road traffic it is stated that the basis of the assessment is to compare the existing ambient noise environment with the predicted ambient noise environment is in line with the draft *Guidelines for Noise Impact Assessment* written by the Institute of Environmental Management and Assessment (IEMA), and the Institute of Acoustics (IOA).

The draft guidelines referred to in the Noise Chapter have now been superseded by the *Guidelines for Environmental Noise Impact Assessment* (2014). However the principle of comparing the baseline noise environment with the operational noise environment remains valid.

At page 67, the superseded guidelines contain a table titled *'Example of Categorising the Significance of the Basic Noise Change'.* This table has been replicated (with minor alteration) as Table 14.1 in the Noise Chapter. The new guidelines do not contain the quoted table.

However, as the change in noise level presented in Table 14.1, and the corresponding impact descriptions, are based upon recognised physical sound descriptors, SLR is of the opinion that Table 14.1 of the Noise Chapter is valid and may be referred to in the assessment.

A Design Manual for Roads and Bridges (DMRB) noise assessment is not considered necessary as the threshold noise values would not be met.

Effects to the Current Noise Climate in the Immediate Surrounding Area due to the Reflection of Railway Noise off the new Building Facades

With reference to *Effects to the Current Noise Climate in the Immediate Surrounding Area due to the Reflection of Railway Noise off the new Building Facades*, the guidance used in the Noise Chapter is the *Calculation of Railway Noise* (1995). This is the correct guidance to use.

In order to determine the impact and significance of any changes in the noise environment, information presented in the superseded draft *Guidelines for Noise Impact Assessment,* and replicated in Table 14.1 of the Noise Chapter, is again used. As discussed previously, whilst the draft guidelines have been replaced, the use of the descriptors in Table 14.1 is considered valid by SLR.

Impact of Rail Vibration on the Proposed Residential Elements of the Scheme

With reference to the impact of *rail vibration on the proposed residential element of the scheme* SLR consider that within the Noise Chapter the following guidance should have been referred to:

- BS6472:2008 *Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting' contains a methodology for assessing the human response to vibration*.

Scoping and Other Consultations

Within the Noise Chapter there is no defined *Scoping and Other Consultations* section. However, at paragraph 14.2.5 it is stated that an Environmental Health Officer at Oxford City Council was consulted and internal noise level limits at the development site were agreed. This consultation is limited to the impact of the external noise environment upon the Phase Two Development. It is not clear as to whether or not objective measures to determine the significance of any changes in the noise environment, as a result of the development, were discussed or agreed.

Chapter 3 of the ES identifies the scope and general methodology for the EIA and ES and outlines the consultation undertaken to date. Table 3.1 details the *scoping consultation and feedback summary* and includes reference to an Environmental Development Memo (dated 20th November 2013). In this memo it is stated that the "*…potential effects on residents of William Lucy Way from potential reflections of train noise from [the] development*…" should be assessed. The impact of reflected railway noise upon residents of William Lucy Way is addressed in the Noise Chapter and is correctly cross referenced in Table 3.1.

Significance

In accordance with the EIA process the following three terms should be used:

- Noise Impact
- Noise Effect; and
- Significance of Effect.

<u>Noise Impact</u>

The noise impact is the change in the noise environment as a result of the development. Table 14.1 of the Noise Chapter presents how Noise Impact will be assessed.

<u>Noise Effect</u>

The noise effect is the consequences of the noise impact. For example an increase in noise may lead to more receptors being annoyed by noise. The effect must therefore be discussed with reference to the receptor type and its sensitivity to the noise impact. The noise effect is not discussed in the Noise Chapter. The Noise Chapter should be updated in order to include reference to the sensitivity of the receptors discussed and the subsequent effect of the noise impact.

<u>Significance of Effect</u>

The significance of any change in the existing noise environment as a direct result of the Phase Two Development is discussed and clearly defined in paragraph 14.2.19, where it is stated that *"Any assessed Moderate, Substantial or Major Impacts would be classed as significant effects."* However, this statement ignores the *Noise Effect*, which must be determined with reference to the sensitivity of the receptor. The Noise Chapter should be updated in order to ensure that the *Significance of Effect* is determined with reference to the *Noise Effect* as well as the *Noise Impact*.

Nature of the Effect

The nature of the noise effect is not determined within the Noise Chapter. It should be stated whether the noise effect is direct or indirect. The noise effect of development related traffic, and development reflected sound, should for example be described as direct effects.

Timescales

The timescale of the noise impact is not determined within the Noise Chapter. It should be stated whether the noise impact is short, medium, or long-term. The timescale of the noise impact of development related traffic, and development reflected sound, should for example be described as long-term.

Technical Difficulties

Chapter 3 of the ES lists the difficulties encountered in the assessment of environmental effects and, with reference to noise, identifies that in 2011 the baseline noise survey was limited to one position at the location of the Phase Two development.

Within the Noise Chapter it is further stated that the original noise survey did not cover William Lucy Way, and as a consequence the 2011 survey data would have to be used as a proxy for William Lucy Way.

The use of this data is reasonable and fully justified at paragraph 14.3.32 of the Noise Chapter.

14.4 Baseline Conditions

Within the Noise Chapter the baseline noise environment is described for the Phase 2 development, at properties on Rodger Dudman Way and at William Lucy Way.

Phase 2 development

At the Phase 2 development the baseline noise environment was established from survey data collected in 2011. The survey was undertaken at one location, at a height of 4m, with noise levels logged every 15 minutes for a continuous 48 hour weekday period.

SLR has reviewed the survey location and found it an acceptable position to establish the noise environment at the Phase 2 development. The position was adjacent to the railway line and at a height of 4m. Whilst a height of 4m is not considered a standard height to measure noise, as it was explained in the Chapter that this height was chosen to enable a clear line of site with the railway SLR considers it acceptable. At this location it may be reasonably expected that the measured noise levels would be at their highest, and when used in the noise assessment would present a robust scenario.

The noise survey results are presented in Appendix 14.1, Figure 14.2. The graphical representation is informative but it is not possible to determine with accuracy the baseline noise parameters at the site. The Noise Chapter would benefit from a tabular version of Figure 14.2 detailing the baseline 2011 daytime and night-time $L_{Aeq,T}$, L_{A90}, L_{A10}, and L_{Amax}.

At paragraph 14.4.1 the following two noise levels are presented in the impact assessment for rail noise on the Phase 2 development:

- Daytime 69dB $L_{Aeq,16hr}$; and
- Night-time 66dB $L_{Aeq,8hr}$..

However, it is not clear that these two noise levels have been calculated from the baseline 2011 noise levels presented in Figure 14.2. Clarification is required.

Roger Dudman Way

At Roger Dudman Way the baseline noise environment was established from survey data collected on the Friday 11th October 2013. The survey was undertaken at two free-field locations, at a height of 1.2m. At each location three daytime noise surveys were undertaken of between 11 and 14 minutes in length with noise levels logged every minute.

SLR has reviewed the two survey locations and is of the opinion that they are acceptable positions to establish the daytime noise environment at properties adjacent to Roger Dudman Way. The two positions may be considered to be representative of the rear gardens of properties on Abbey Road and the front gardens of Cripley Road.

As the measured noise levels will be compared against the predicted ambient noise level of traffic associated with the development, SLR acknowledges that the measurements were undertaken in free-field conditions and at times that avoided typically busier periods such as the morning and evening rush hours. Measurement undertaken during *'noisier'* periods would have led to an unfair comparison.

William Lucy Way

The 2011 baseline noise survey was undertaken at one location at the Phase 2 development only, no survey was undertaken at William Lucy Way.

For the purpose of assessing the impact of mechanical services plant upon the noise environment at William Lucy Way an argument is put forward, at paragraphs 14.3.20 and 14.3.21, to use the 2011 baseline survey data collected at the Phase 2 development as a proxy. SLR is of the opinion that the use of this data for this purpose is reasonable and fully justified.

Whilst the use of the 2011 Phase 2 development baseline data as a proxy is proposed and justified, baseline noise data collected on behalf of Network Rail by Environmental Resources Management (ERM) in 2009 at William Lucy Way is then presented. The data collected by ERM is discussed and a resultant $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ are provided at paragraph 14.3.28. These two noise levels are replicated below:

- Daytime 54dB LAeq,16hr; and
- Daytime 54dB LAeq,8hr.

Whilst it is stated that the ERM data has been included for reference only, and is not taken forward for use in the assessment, clarification is required as to whether the second noise level is a night-time $L_{Aeq,8hr}$, rather than a daytime $L_{Aeq,8hr}$. If the noise levels are taken forward for assessment in the future an explanation as to why the two $L_{Aeq,T}$ values are the same should be sought.

14.5 Impact Assessment

Impact of Rail Noise on Proposed Residential Elements of the Scheme

At paragraph 14.4.1 the following two noise levels are presented in the impact assessment for rail noise on the Phase 2 development:

- Daytime 69dB LAeq,16hr; and
- Night-time 66dB LAeq,8hr.

It is not clear that these two noise levels have been calculated from the baseline 2011 noise levels presented in Figure 14.2. Clarification is required.

It is then stated at paragraph 14.4.2 that:

"The external building fabric for the proposed buildings was designed in order to ensure that the required internal noise levels are achieved, and a suitable scheme of construction needs to be determined based on the survey results."

The assessment does not characterise the impact and effect of the external noise levels incident upon the site and the significance of the impact is not subsequently determined.

SLR advises that the impact of noise upon the site is determined. For example, reference may be made to a NOAEL, a LOAEL, and a SOAEL. The significance of the effect should then be determined with reference to the sensitivity of the receptor.

Noise from Mechanical Services Plant

At paragraph 14.4.3 it is stated that noise from mechanical services at the Phase 2 development should not exceed the following noise levels:

- Daytime: (07:00 – 23:00) 42dB(A); and
- Night-time: (23:00 – 07:00) 37dB(A).

With reference to paragraph 14.2.11, SLR understand that these noise levels are 5dB(A) below the baseline measured background noise levels at the site surveyed at the Phase 2 development in 2011.

It is stated in paragraph 14.3.21 that the limits presented are based on the "…*lowest background noise levels recorded during any 15 minute period of the day or night of the 48 hour survey period."* Setting the limits against the lowest background noise level measured is a robust approach but is not in accordance with the guidance.

From an analysis of Figure 14.2, SLR do not disagree with the limits set, however for clarity, it would be advantageous for the measured data to be presented in full in a separate table.

Whilst an appropriate limit may have been set, the predicted noise levels of plant at nearby sensitive receptors have not been determined. As the noise level of plant has not been established it is not then possible to compare the predicted noise levels with the proposed limits. As a consequence the noise impact, the noise effect, and the significance of the impact, cannot be determined.

Whilst it is appreciated by SLR that the development contains a limited amount of plant, it is advised that plant noise levels are determined, and the subsequent impact, effect, and significance of the impact, at nearby sensitive receptors, established.

Noise from Road Traffic Associated with the Scheme

In order to determine the impact of development related traffic movements upon the noise environment of existing sensitive receptors adjacent to Roger Dudman Way, it is necessary to establish the number of vehicle movements associated with the Phase 2 development.

The additional worst-case peak hour trips associated with the development are presented in Table 14.6 of the Noise Chapter. At paragraph 14.4.16 it is explained that each trip will generate two movements. The resultant movements in a one hour period are not clearly

tabulated but it is acknowledged by SLR that seven car movements and four transit van movements have been used in the subsequent calculations.

From an analysis of Table 14.6 it is clear that the hourly movements quoted include traffic movement from Phase 1 as well as Phase 2. As a comparison is to be made against the existing baseline noise environment, it could have been assumed that Phase 1 traffic noise was part of the existing baseline. The approach is therefore considered robust.

At paragraph 14.4.18 the calculated traffic noise level at the rear facades of properties that front onto Abbey Road is 49dB $L_{Aeq,1hr}$. SLR has checked this calculation and found the traffic noise level at this location to be 48.4dB $L_{Aeq,1hr}$. Whilst SLR's calculated noise level is lower than that presented in the Noise Chapter, it is assumed that the higher noise level in the Report has been rounded up.

At paragraph 14.4.18 the calculated traffic noise level at the rear facades of properties that front onto Cripley Road is 44dB $L_{Aeq,1hr}$. SLR has checked this calculation and found the traffic noise level at this location to be 43.8dB $L_{Aeq,1hr}$. Whilst SLR's calculated noise level is lower than that presented in the Noise Chapter, it is considered that the higher noise level in the Report has been rounded up.

Paragraph 14.4.20 states that, at MP1 (Abbey Road), the predicted traffic noise level of 49dB would have "*no effect on the existing ambient noise levels".* This statement is based upon the existing ambient noise levels, in the absence of railway klaxons, being "*in the order of L_{Aeq} 60-62dB".*

From a review of the data presented in Appendix 14.2, SLR calculate that in the absence of railway klaxons the L_{Aeq} at MP1 is between 56.6dB and 67.9dB, not 60dB and 62dB.

SLR recommend that the Noise Chapter is updated and that the predicted traffic noise level of 49dB at the rear facades of properties that front onto Abbey Road is logarithmically added to the lower measured noise level of 56.6dB. With reference to Table 14.1 of the Noise Chapter, the impact of traffic noise should then be determined, and the effect and significance of the impact established.

Paragraph 14.4.22 states that, at MP2 (Cripley Road), the predicted traffic noise level of 44dB would have "*…a minor noise impact only".* This statement is based upon the existing ambient noise levels, in the absence of railway klaxons, being "*in the order of "L_{Aeq} 52-55dB".*

From a review of the data presented in Appendix 14.2 SLR agree with the existing ambient noise levels quoted and the quoted impact. The effect and significance of the noise impact however requires clarification.

Effects to the Current Noise Climate in the Immediate Surrounding Area due to the Reflection of Railway Noise off the new Building Facades

In order to assess the impact of any increase in noise level at Willow Lucy Way as a result of railway noise reflecting off the Phase 2 development towards existing sensitive receptors, a number of noise models are presented in the Noise Chapter.

In order to determine the change in noise level, models with identical noise inputs but with and without the Phase 2 development are compared. SLR considers this approach to be logical.

Façade noise levels at Willow Lucy Way are then calculated, and the increase in noise level as result of reflectance from the Phase 2 development, is then presented. It is determined that the noise level will increase by between 0.2dB and 1.3dB depending upon location.

With reference to Table 14.1 it is stated that the impact will be minor. However the noise effect and the significance of the effect are not determined. The effect and significance of the impact requires clarification.

14.6 Mitigation Measures

Impact of Rail Noise on Proposed Residential Elements of the Scheme

In this section of the Noise Chapter mitigation measures to reduce the internal noise levels at the Phase 2 development are discussed.

Within the discussion with respect to mitigation required reference should be made to the predicted impact of noise, and the significance of the impact. It is stated that mitigation measures are needed in order to reduce noise levels to the "*…required internal noise levels…"* but reference is not made as to the magnitude of the impact or the significance of the effect without mitigation.

Nevertheless, mitigation measures are then listed at paragraph 14.5.1.

It is considered by SLR that paragraphs 14.5.2 to 14.5.4 whilst not incorrect, should be moved to the '*Residual Effects'* section of the Noise Chapter.

Noise from Mechanical Services Plant

In this section of the Noise Chapter mitigation measures to reduce the noise level from mechanical services plant is briefly discussed.

It is stated at paragraph 14.5.6 that:

"The design of the buildings and mechanical services systems shall incorporate suitable attenuation measures in order to ensure that the plant noise emission limits for the scheme are achieved."

Within the discussion with respect to mitigation required reference should be made to the predicted impact of noise, and the significance of the impact. In the *'Impact Assessment*' the predicted plant noise levels at sensitive receptors were not determined. As the noise level of plant was not established it was not then possible to compare the predictions with the proposed limits. As a consequence the noise impact, and the significance of the impact, was not determined.

As no impact was determined and the significance of the effect was not established it is not possible to indicate what mitigation measures may be required.

Whilst it is appreciated by SLR that the development contains a limited amount of plant, and that the design of the site has incorporated attenuation measures to reduce plant noise levels, without a prediction of plant noise levels, the need or otherwise for mitigation cannot be established.

SLR recommend that plant noise levels are determined, and the subsequent impact, and significance of the impact, at nearby sensitive receptors, established, in order for the required mitigation to be discussed.

Noise from Road Traffic Associated with the Scheme

It is stated in this section of the Noise Chapter that, as the predicted impact of development traffic upon the existing ambient noise environment is predicted to be minor at worst, no mitigation measures to reduce traffic noise are required.

SLR is in agreement with this statement.

Effects to the Current Noise Climate in the Immediate Surrounding Area due to the Reflection of Railway Noise off the new Building Facades

It is stated in this section of the Noise Chapter that the predicted impact of reflected sound upon the noise environment at Willow Lucy Way is predicted to be minor at worst. It is stated that the increase in noise level caused by reflectance from through trains is 1dB(A), whilst the increase in noise level caused by reflectance from idling trains is also 1dB(A).

Whilst these noise levels differ from those presented in paragraph 14.4.35 and paragraph 14.4.37, which states noise level increases of up to 1.3dB and 1.2dB respectively, the conclusion that the impact would be minor would remain the same. For consistency however, clarification upon the noise levels presented in paragraph 14.5.10 is required.

The Noise Chapter then goes on to discuss the requirement for mitigation and justification for providing no mitigation is given. SLR agrees with the justification provided.

14.7 Residual Effects

Impact of Rail Noise on Proposed Residential Elements of the Scheme

The residual impact and effect of railway noise upon the Phase 2 site, following the implementation of the mitigation measures presented in paragraph 14.5.1 of the Noise Chapter, are not presented in the *Residual Impacts* section of the Noise Chapter.

The results of post construction internal noise and vibration surveys are however discussed in paragraphs 14.5.2 through to 14.5.4. The noise survey is presented in Appendix 14.3 and the vibration survey is presented in Appendix 14.4.

In the *Residual Effects* section of the Noise Chapter the assessment presented in the *Impact Assessment* section (which should be completed with no mitigation in place), should be repeated with the mitigation measures in place.

The post mitigation assessment has been undertaken (see Appendix 14.3 and 14.4) but the required terminology of residual impact, and residual effect, has not been included. The assessment undertaken needs to be presented in the *Residual Effects* section of the Chapter.

Noise from Mechanical Services Plant

With regards to the residual impact and effect of mechanical services plant it is stated at paragraph 14.6.1 that:

"Background noise levels at the William Lucy Way Flats elevated by up to 1dB(A) as a result of mechanical service systems serving the site, but in line with the proposed strategy for mechanical services control."

As an assessment of noise from mechanical services plant at the Phase 2 development site has not been undertaken, it is not possible to state that noise levels off-site may be elevated by up to 1dB(A) after mitigation measures have been implemented.

Whilst it is appreciated by SLR that the development contains a limited amount of plant, the *Impact Assessment* and the *Residual Impact Assessment* require updating in order to present the correct EIA process of identifying impact, effect, and significance.

Alternatively justification for not undertaking a mechanical plant noise assessment should be provided, for example, providing a list of plant and a plan detailing the plant location, may enable the requirement for such an assessment to be scoped out of the Chapter.

Noise from Road Traffic Associated with the Scheme

It is established in paragraph 14.5.9 of the Noise Chapter that no mitigation measures to reduce development related traffic noise are required. Therefore a *Residual Impact* assessment is not needed, nor presented.

Effects to the Current Noise Climate in the Immediate Surrounding Area due to the Reflection of Railway Noise off the new Building Facades

It is established in paragraph 14.5.15 of the Noise Chapter that no mitigation measures to reduce reflected sound are considered practicable. Therefore a *Residual Impact* assessment is not required, nor presented.

Additional Noise Surveys

Paragraphs 14.6.2 to 14.6.15 whilst within the *Residual Impacts* section of the Noise Chapter detail:

- A 2014 noise survey at the location of the Phase 2 development; and
- A 2014 noise survey at Willow Lucy Way.

These two surveys replicate the 2011 baseline noise survey at the Phase 2 site, and the ERM 2009 survey at Willow Lucy Way. The purpose of the 2014 surveys is to make a direct comparison with the respective surveys undertaken in 2011 and 2009.

SLR would recommend that this section of the Noise Chapter is removed from the *Residual Impacts* section and re-positioned or referenced within the *Baseline Conditions* section of the Chapter.

14.8 Impact Interaction

Cumulative Effects

Within this section of the Noise Chapter two other developments are discussed:

- Network Rail's plan to electrify the railway line at Oxford by 2016;
- Network Rail's plan to expand operations through Oxford Station.

Whilst it is not considered necessary to repeat each of the four distinct assessments presented taking into account the two developments listed above, SLR would expect the Noise Chapter to discuss the potential beneficial or adverse impacts of each development upon the noise environment at the Phase 2 site. The subsequent effect of a potentially '*quieter*' or '*noisier*' offsite noise environment should then be discussed with reference to the

potential change in the significance of the impact of mechanical plant and development related traffic at nearby sensitive receptor locations.

14.9 Summary

At section 14.8 of the Noise Chapter a summary is provided. The section is a narrative summary of the Chapter presented. SLR advises that this narrative summary is updated to include the updates/clarifications requested in this review which are as follows:

- the Scope Section needs to be revised to include;
  - construction noise; and
  - an assessment of the effect of railway vibration upon the proposed residential accommodation;
- the Assessment Section needs to be revised to include;
  - a construction noise assessment;
  - the effect of railway vibration upon the proposed residential accommodation assessment;
  - update of the *effect of noise from the railway on the proposed residential accommodation within the scheme itself assessment* section to include reference to the National Planning Policy Framework (2012), the Explanatory Note to the Noise Policy Statement for England (NPSE)and *the Planning Practice Guidance (2014)*.
  - update of the Chapter to include reference to the sensitivity of the receptors discussed and the subsequent effect of the noise impact;
  - update of the Chapter to ensure that the *Significance of Effect* is determined with reference to the *Noise Effect* as well as the *Noise Impact;*
  - update of the Chapter to ensure that the nature of the noise effect is determined
  - update of Chapter to state whether noise effects will be the direct or indirect;
  - update of the Chapter to determine the timescale of the noise impact;
  - update of all assessments undertaken characterise the impact and effect of the assessment in question and the significance of the impact;
- the Mitigation Section needs to be revised to include:
  - construction noise mitigation;
  - railway vibration mitigation;
  - the mitigation measures required to reduce noise levels at the location of the Phase 2 Development;
  - the mitigation measures required to reduce noise levels from fixed mechanical plant at the location of off-site sensitive receptors 2 Development;
- the Residual Section needs to be revised to include:
  - an assessment of construction noise with mitigation in place;
  - an assessment of railway vibration with mitigation in place;
  - an assessment of railway noise following the implementation of the mitigation measures presented in paragraph 14.5.1; and
  - an assessment of mechanical plant noise with mitigation in place.

In addition to the narrative summary it is best practice to include a table that sets out the summary of impacts and effects.

Within the summary table SLR recommends that for each assessment undertaken the impact, effect, and significance are clearly presented. The results should be presented for '*the no mitigation'* scenario, the impact assessment, and for the '*mitigated'* scenario, the residual impact assessment.

15.0 SOCIO-ECONOMIC BACKGROUND

15.1 Introduction

The aim of ES Chapter 15 was as follows:

"Chapter 15 Socio-Economic background: This provides an assessment of the impact of the University on the Oxford economy, the social and economic effects of the development of the Castle Mill Phase 2 graduate accommodation development, and of the implications of the mitigation options that have been considered" (Chapter 1, 1.3.3, paragraph 14).

And

"This chapter of the ES has been prepared to provide information about the University of Oxford and its impacts on Oxford as a City in terms of its positive and significant contribution to the local economy and the impact which it has, particularly in relation to the pressures exerted by students on the conventional housing stock" (Chapter 15, 15.1.1)

Options for mitigation of adverse impacts

As a result of the assessment of the environmental effects of the development, additional measures have been identified in order to mitigate the environmental effects, in particular in relation to landscape and visual effects and effects on the historic environment.

The Design Mitigation Strategy (DMS) has identified six potential measures, comprising:

1. Changes to the elevations of the building facades;
2. Tree planting in the badger run along the west boundary of the site;
3. Introduction of a planted boundary to increase screening between the buildings and Port Meadow;
4. Removal of some buildings entirely;
5. Modifications to the form of the roofscape of the buildings, including to reduce height; and
6. Reduction in the height of various buildings through the removal of a floor.

The DMS considers combinations of different measures to assess how best to mitigate the effects of development, comprising:

- Option 1: Building façade treatment (design mitigation measure 1) and tree planting along western boundary of the site in the Badger run (measure 2);
- Option 2: Building façade treatment (design mitigation measure 1), tree planting (measure 2) and modification of roof forms to hip and low level roofs (measure 5);
- Option 3: Building façade treatment (design mitigation measure 1), tree planting (measure 2), removal of a floor from six buildings and replacement of all roofs with low level roofs (measure 6). A total of 33 student residence units (38 bedrooms) would be removed under this option.

The University has reviewed the implications of the options in the DMS, and proposes to undertake design mitigation measures 1 and 2 as included in Option 1 set out in the Design Mitigation Strategy.

15.2 Scope

The Scope, EIA Methodology and Consultation are discussed in Chapter 3 of the ES.

Chapter 15 provides an assessment of the proposed mitigation options. In doing so, the coverage provided by the assessment covers the following aspects:

- Baseline conditions – provides a background to the University, its economic role and contribution, plus the impact that the University has the City's conventional housing market
- Policy constraints – provides background to the policy constraint that imposes a limit of no more than 3,000 students living outside provided accommodation, as well as an explanation of the impact of housing need on the University's growth and development
- Impact assessment – provides a discussion of the potential implications of the mitigation options on future growth and development of the University, in particular any option that results in a loss of student accommodation

Chapter 3 of the ES also summarises the consultation feedback in Table 3.1 Scoping Consultation and Feedback Summary. This includes three points of relevance to the socio-economic impact assessment.

- CPRE Oxfordshire raised concerns regarding population (recreational access routes, health).
- Oxfordshire Architectural and Historical Society raised concerns 'sensitivity of location relating to use of river, rights of way, National Trail, open access'.
- Freemen of Oxford – concerned with regard to 'tranquillity'.

This consultation feedback may be addressed in other chapters but does not appear to be covered within Chapter 15.

15.3 Methodology

The proposed methodology for the ES is described in Chapter 3 as follows:

"For each chapter topic, the magnitude and level of effect (or significance) of impacts, after mitigation measures have been taken into account, are reported under the heading 'residual impacts', in recognition of the iterative EIA process" (Chapter 3, 3.3.18)

However, it appears that SIA has not followed the same methodology, especially with regard to magnitude and level of effect (or significance) of impacts.

15.4 Baseline Conditions

As discussed in Chapter 2 of the ES prior to development of the site for graduate student accommodation, the site mostly comprised of semi-improved neutral grassland, together with areas of scrub and tall ruderal plants, a row of semi-mature aspens, and a paved footpath/cycle track. The later has been maintained as a newly paved surface along the eastern side of the development.

Mapping evidence indicates that the site had been vacant since the late 1990s, although part of the site had previously been used for allotments. "*The area surrounding the site is shown in Figure 2.2. It is adjoined along its western boundary by the Cripley Meadows Allotments, beyond which lie Fiddler's Stream, Fiddler's Island and the main channel of the River Thames. The village of Binsey lies 500 metres to the north west"* (Chapter 2, 2.2.1).

"The short northern boundary of the site adjoins the Castle Mill Stream, a tributary of the Thames. A footbridge provides access to the public car park at the end of Walton Well Road, beyond which lies Port Meadow, with Wolvercote Common beyond, and the residential area of Jericho to the east. Port Meadow is also public access and grazing land (with rights granted to the Freemen of Oxford by King Alfred in the 10th century), still used for horses and cattle" (Chapter 2, 2.2.3).

Other key socio-economic aspects of the site characteristics include:

- That it adjoins but is not included in the Green Belt;
- The historic and conservation importance of Port Meadow;
- Port Meadow as a recreational asset;
- The network of public rights of way and access land; and
- The residential populations of Jericho, Osney and the more recent residential developments.

15.5 Impact Assessment

The EIA Regulations require an ES to identify the 'likely significant effects' of a development. The primary purpose of scoping is therefore to ensure that the assessment focuses on those aspects that are likely to give rise to significant effects. At the same time, aspects that are unlikely to give rise to significant effects can be identified and 'scoped out' of the assessment. (Chapter 3, 3.2)

In SLR's judgement the coverage of the socio-economic assessment of the mitigation options for the Castle Hill graduate accommodation should have included the potential effects on at least four markets, as follows:

1. Potential impacts on the construction market
2. Potential impacts on tourism and leisure markets
3. Potential impacts on the Higher Education market
4. Potential impacts on the conventional housing market

The rationale for the need to consider the possible effects on each of these markets is that each of the options, including the additional option of doing nothing more (*i.e*. leaving the development as it is and not addressing the adverse impacts on landscape and visual amenity and the historic environment), has the potential to effect, either positively or negatively, the amount of future economic activity that takes place in each of those markets in the City of Oxford area.

The socio-economic assessment as it stands considers, to some extent, the potential effects of the options in respect of two of the markets only: viz. the potential effects on (3) the Higher Education market and (4) the conventional housing market.

However, the effects on the local tourism and leisure industry and the construction sector are not considered: the reason why SLR considers this to be an omission, and the additional steps SLR recommend be undertaken to address this gap, are discussed below.

Impacts on the construction market

The socio-economic assessment advises that the estimated (albeit preliminary) costs of undertaking works to undertake mitigation options 1-3 vary from a minimum of £6 million (Option 1) to a maximum of £30 million (Option 3). (It is not stated clearly what the estimated costs would be of undertaking the proposed strategy, which is to undertake design mitigation measures 1 and 2 as included in Option 1 set out in the Design Mitigation Strategy).

Each of the mitigation Options 1-3 would therefore involve additional construction and/or landscaping expenditure, which would presumably involve the letting of new works contracts that stands to benefit building and/or landscaping businesses that operate (but may not be based) in the Oxford area.

Although such expenditure would clearly represent a financial burden to the University (the implications of which are explored to some extent in the socio-economic assessment, and are covered in more detail below) it would still be the case that the letting of such contracts would bring economic benefits to businesses that can compete for the contracts and provide the services. Apart from the direct benefits to the businesses from additional turnover, there would also be indirect (supply chain) and induced (multiplier) benefits as building and other materials are purchased, and as employees spend their earnings with other businesses in the area.

A typical rule of thumb in economic impact assessments of residential building and similar construction projects is that 1 person year of construction employment is supported for each £150,000 of construction phase expenditure. On that basis, mitigation options 1-3 could stand to support in gross terms between 40 and 200 person-years of construction expenditure. The net additional impacts on the City of Oxford economy would depend, however, on the extent to which local businesses and local employees benefited from the contracted expenditure. A typical estimate for net additional impacts at a local level varies from 35%-45%, so the net additional impact could amount to between 14 and 90 person years of construction phase employment.

It is the case that such impacts are temporary and would only be available during the period when construction activity is being undertaken. In the same way, the construction phase benefits of the original construction, which lasted 15 months between July 2012 and September 2013, were temporary and have since dissipated.

It is also the case that there may be a deadweight impact effect to consider which would potentially reduce the likely impact of construction phase benefits of the mitigation options. The potential for deadweight exists because one of the arguments presented in the socio-economic assessment is that the financial burden of implementing a mitigation option may be to delay or prevent the University from undertaking aspects of its development programme: if this is the case, the potential impact of implementing a mitigation option would likely be to delay or prevent the letting of construction contracts on planned education and/or research facilities or other infrastructure, with consequent loss of opportunities for construction employment in delivering these facilities.

It is difficult to assess how likely is the possibility that other developments would be stymied if one of the more expensive mitigation options was implemented: not enough information is provided in the socio-economic assessment to enable an estimation to be made (this is also discussed under the topic '*Impacts on the Higher Education market*' below).

However, SLR considers that some of the issues could have been presented and discussed in the socio-economic assessment to provide for a fuller assessment of both potential short, medium and longer term impacts on the construction sector and the industries that supply it.

Impacts on tourism & leisure markets

According to the Environmental Statement Non-technical Summary:

"The defining distinctive landscape and visual characteristics of the Site and its setting, pre development, derived from the baseline conditions, are described, and the effects of the development on the landscape and visual receptors, during construction and operational

phases, are assessed in the ES in chapter 7. The assessment determines that, in a considerable number of cases, the sensitivity of various landscape and visual receptors is judged to be moderate or high, the magnitude of effect is judged to be medium or high, and the level of effect is consider to be moderate or substantial adverse" (Section 7, paragraph 6).

Also from the Environmental Statement Non-technical Summary it is stated that in terms of the effects on the historic environment:

"The development has a 'high adverse' impact on four heritage assets of high heritage value, namely

- *St. Barnabas church, a grade 1 listed building;*
- *Port Meadow, a scheduled monument and registered common;*
- *the river Thames and towpath; and*
- *the Oxford skyline"* (Section 8, paragraph 3).

Moreover, it is further stated that:

"Mitigation measures designed to address some of these impacts have beneficial effects, but it is considered that the 'high adverse' impacts on the high heritage value sites can only be reduced to 'medium adverse' by the reduction in height of all the buildings under the option 3 mitigation measures set out in the Design Mitigation Strategy" (Section 8, paragraph 5).

Given that the site is close to and is visible from the river and the Thames Path (which is a National Trail and therefore an important leisure and visitor economy asset), the adverse effects on views from the Thames and the towpath raises questions about whether there may be potential adverse impacts on the numbers of visitors/users and/or the length/duration of visits/stays/episodes of usage of these recreational assets as a consequence of a deterioration in the amenity of the area.

A report prepared for DEFRA in 2011[15] highlighted the important role played by inland waterways to national, regional and local tourism and recreation markets. For example, the study highlighted that average per user willingness to pay for informal use of towpaths for walking was between £3.50 and £5.00 (in 2010 prices) and for cycling was between £4.50 and £5.50 per visit. Substantial amounts of average expenditure per day visitor (£12-£20 per visitor per day) and overnight visitor (£60-£80 per night) were also reported by the study.

On this basis, if the number of users/visitors that may be potentially deterred for using the towpath in the vicinity of the Castle Mill scheme is significant then the amount of lost visitor expenditure and local user benefits (measured in terms of aggregate willingness to pay, which is a proxy for consumer surplus) could amount to a significant value.

However, no information is provided in the socio-economic assessment with respect to estimated levels of usage of the Thames Path and the river, and therefore it is not possible to begin to estimate whether this aspect of potential impact is of significance or not.

Given that the assessment concedes that the impacts on the historic heritage assets could be 'highly adverse', this appears to be a significant omission from the assessment.

There is also no information regarding the potential impacts on local users. An assessment of this could include investigating any deterrence effect on local users which could result in a

[15] DEFRA: the Value of Inland waterways in England and Wales, 2011

potential loss of societal welfare, such as an erosion of the health and well-being benefits of exercise, fresh air, etc. for those individuals who may be adversely affected to the point that they walk or exercise less because of the effects of the scheme on local amenity.

Given the importance of local amenity and the consultation responses this appears to be a significant omission from the assessment.

Impacts on the Higher Education market

The socio-economic assessment sets out in clear terms the international prestige of the University and its importance nationally as an originator of knowledge and disseminator of learning. The increasing importance of the role played by University is reinforced by the growing significance of the 'knowledge economy' as a driver for competitiveness and prosperity.

The localised impact of the University is also underlined by estimates provided in the socio-economic assessment as to the quantities of direct, indirect and induced employment that are attributable to the University and the higher education sector as a whole. An overall estimate is provided amounting to 11,300 direct jobs and 4,300 indirect and induced jobs.

However, this data is sourced from a 2006 study, and an opportunity could have been taken to update this estimate using more recent data. For example, data from the 2013 BRES released recently by ONS indicates that there were 23,196 HE jobs located in the City of Oxford in 2013. Using the same 38% assumption for indirect/induced employment, the overall estimate of the contribution of the HE sector in the City is now around 32,000 jobs.

The socio-economic assessment goes into detail regarding the potential impacts of planning policies that seek to constrain the number of university students living in the City outside provided accommodation. In particular the Oxford Core Strategy:

"…seeks to exercise control over students living outside provided accommodation by controlling the ability of the University to either provide or occupy new administrative or academic floorspace: unless student living outside provided accommodation is 3,000 or less, the Council intends either to refuse planning permission or to impose conditions not permitting occupation of any new buildings until this figure (or below) is reached. Consequently, the policy has a direct impact on the University its ability to modernise and expand and its ability to maintain and expand its crucial economic role in Oxford if it is unable to meet the figure of 3,000 students or less living outside provided accommodation. It also has potential impacts on its ability to compete alongside other institutions nationally and internationally and as a consequence to maintain its high standards and status" (Chapter 15, 15.2.19)

It is clear from this paragraph that any of the mitigation options that result in temporary relocations of students into the wider community (*i.e.* while works are being undertaken) could have the effect of delaying permissions for new developments at the University, while option 3 (which would have the effect of permanently reducing the number of graduate accommodation units) would likely have a permanent impact.

While this is clearly explained in the socio-economic assessment, it is not clear what the longer term impacts could amount to. The assessment refers to a potential pipeline of planned or proposed developments, including in the Science Area, the Radcliffe Observatory Quarter and the Old Road campus[16]. The scale of development – including the potential for

[16] Socio-economic assessment paragraph 15.2.9.

a stimulus to the number of students – and the potential phasing is not discussed. This makes it more difficult to ascertain in numerical terms of potential scale and timing of interaction between the mitigation options for Castle Mill and the downstream development opportunities identified in the socio-economic assessment.

This absence of necessary information on the potential development pipeline also makes it difficult to assess the potential scale and timing of the deadweight impacts on construction phase expenditure and employment referred to under the 'Impacts on construction market' heading above.

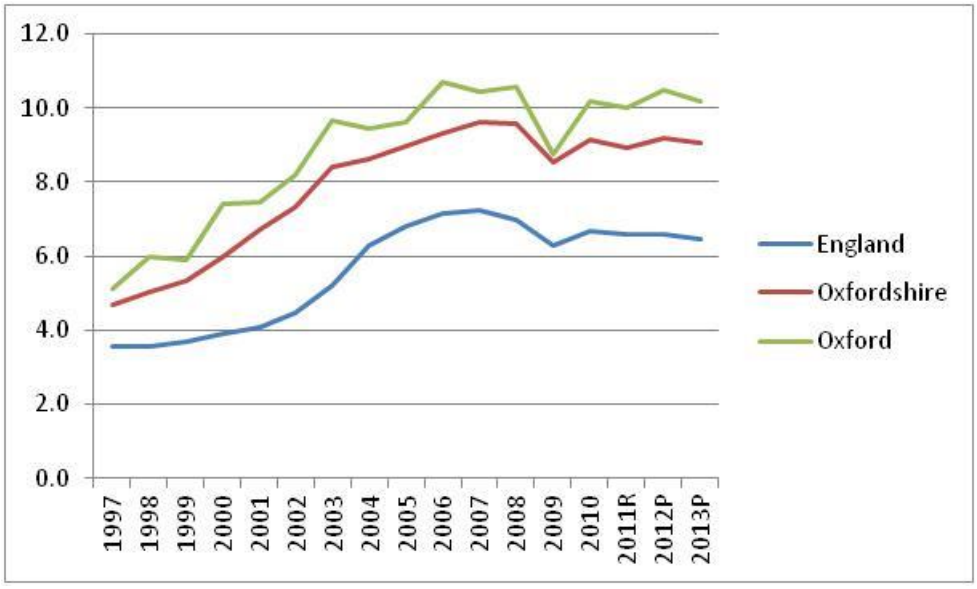
Impacts on the conventional housing market

The socio-economic assessment also draws attention to the potential impact of the mitigation options on the conventional housing market in Oxford. Such impacts could arise on a temporary basis if students need to be temporarily relocated into the community whilst works are being undertaken to modify the graduate accommodation. However, under Option 3 there would be a permanent loss of 33 student residential units (with 38 bedrooms); hence under this option the effects on the conventional housing market would be long term.

As indicated in the socio-economic assessment, there is a long-stranding and acute housing market problem in the City of Oxford, which is a part of a wider strategic housing market area (Oxfordshire) that also exhibits pronounced symptoms of housing under-supply.

One key metric of the lack of affordability in local housing markets is the ratio of lower quartile house prices to lower quartile earnings. Data on this measure is released regularly by the Department for Communities and Local Government, and the chart below illustrates the trend for the City of Oxford since 1997, benchmarked against the Oxfordshire and England averages. (Note: data for 2012 and 2013 is provisional).

Figure 1: Ratio of lower quartile house prices to lower quartile earnings.



Source: DCLG Live Table 576

Clearly, the data indicates that affordability problems are significantly worse for Oxford compared to the country as a whole, and that the trend has worsened over time (apart from a temporary dip associated with the onset of the finance market crisis and subsequent recession of 2008-2010, but the alleviation that this brought has since been eroded).

Given this context, perhaps more could have been done in the socio-economic assessment to assess the extent to which the temporary (or permanent) loss of student accommodation might affect particular housing sub-markets (such as in the rental sector), but overall the assessment succeeds in conveying the message that the adoption of any of the mitigation strategies that require temporary or (especially) permanent losses of student accommodation and which would require students to compete for conventional housing would inevitably worsen the conventional housing supply problem in the City of Oxford.

The potential social impacts of inadequate housing provision, for example, without the scheme (or under a scenario where the amount of student housing is reduced) could result in adverse social impacts as a consequence of increased pressure on the conventional housing market. If this was the case a key consequence of an under-provision of housing compared to levels of demand is rising house prices and housing rents in real terms, with consequential impacts on housing affordability. Housing affordability is clearly an important issue and concern for Oxford, with affordability ratios notably higher than national and regional averages.

There are also potentially considerable wealth distribution impacts associated with rising house prices and rents. Data from HMRC[17] confirms that wealth inequalities have been increasing in the UK in line with rising house prices; one consequence is the long-term transfer of wealth in favour of home-owners and at the expense of non-owners of homes. The substantial increase in the average age of first time buyers over the past two decades is another cause of rising inequality and a symptom of inter-generational wealth transfer.

Moreover, a lack of supply of affordable housing can result in significant adverse social consequences, including for health outcomes, children's educational performance and other metrics of societal well-being. Research undertaken by Shelter has identified a clear link between over-crowded housing conditions or a lack of housing and a number of medical conditions[18] and in a separate report has highlighted in particular the adverse impacts of poor housing on the life chances of children[19].

Given that the assessment is concerned with housing the social aspects of this could be further investigated and assessed.

15.6 Mitigation Measures

No socio-economic mitigation measures of the DMS are discussed.

15.7 Residual Effects

No socio-economic residual effects of the DMS are discussed.

15.8 Impact Interaction

The Impact Interactions section provides a summary of the financial and wider consequences of each potential mitigation option on the future of the University. The assessment concludes that the social and economic implications of each of the three mitigation options would be significant for the University, and that each would impose substantial financial costs, ranging from preliminary estimates of: £6 million under Option 1;

[17] HMRC Statistics on the Distribution of Personal Wealth

[18] Shelter: Living in Limbo (2004)

[19] Shelter: Chances of a lifetime: the impact of poor housing on children's lives (2006)

£13.5 million with Option 2; and £30 million under Option 3. The options would also have temporary displacement effects on local housing markets as students would need to be temporarily re-housed while works were undertaken. Moreover, Option 3 would have permanent detrimental impacts on the local housing market as it would result in the permanent loss of 33 student residential units (with 38 bedrooms).

As stated above, the University proposes to undertake design mitigation measures 1 and 2 as included in Option 1 set out in the Design Mitigation Strategy. There is no discussion as to whether this will result in any temporary re-housing and if so for how long.

15.9 Summary

The key points from review of Chapter 15 of the ES are as follows:

- The aim of the chapter as stated in Chapter 1 and Chapter 15 differ. The former indicates an 'assessment' whereas the latter is to 'provide information' (although in the summary it states that an assessment has been undertaken). This leads to some confusion throughout the chapter in terms of purpose and structure;
- The scope of the chapter differs from that outlined in Chapter 3 and does not refer directly to consultation responses of relevance to socio-economic impact;
- The methodology does not follow that stated in Chapter 3 especially with regard to magnitude and level of effect (or significance) of impacts for which no clear method is presented;
- There could be further consideration of the effects on local amenity and the potential adverse impact on local users;
- In relation to the above there could have been greater consideration of relevant Oxford City Council policies and strategies such as the Green Spaces Strategy 2013-2027 and the Sport and Physical Activity Review 2009-2014;
- There is no discussion of socio-economic mitigation measures;
- There is no discussion of socio-economic residual effects;
- The socio-economic assessment should have included the potential effects in sufficient depth on at least four markets, as follows:
    1. Potential impacts on the construction market
    2. Potential impacts on tourism and leisure markets
    3. Potential impacts on the Higher Education market
    4. Potential impacts on the conventional housing market
- A 'do nothing' option is not considered in SIA terms.

In summary it is not possible to reach the same conclusion as that presented in the ES due to omissions in the scope and methodology of the SIA chapter. In order for a proper assessment to be made it is recommended that the purpose and structure is revised to address the points set out above.

16.0 CONCLUSIONS OF ES REVIEW

16.1 Introduction

SLR appreciates the difficulty in some instances of undertaking a post-development EIA and the limitations that can be faced particularly with regard to survey information. Accordingly, the need to make reasonable assumptions in parts is accepted.

16.2 The Regulations

In the main, it is considered that the ES broadly accords with the requirements of the Regulations albeit the technical assessments, survey data and reporting in the ES are considered to contain areas of weakness, omissions and inconsistencies, which have been highlighted in the respective chapters.

16.3 Conclusions of the ES

SLR cannot verify the conclusions of the ES due to the omissions *etc.* identified. Of particular note is the dismissal of Design Mitigation Options 2 and 3 on a socio-economic basis when other than the financial cost to the University of undertaking those works, there has been no assessment of the construction impacts and the significance associated with these options *e.g.* labour market and local spending from that labour force.

In addition, the ES was predicated in the early chapters on the basis of Design Mitigation Option 1 to address the harm identified as a result of the extant development. However, it is noted that only a limited number of chapters considered that Option in the assessment, for example, it is considered that the transportation impacts of Option 1 should have been investigated. Unfortunately, the resultant document is somewhat confusing in parts.

16.4 Recommendations

Whilst it is appreciated that this is a voluntary ES submitted by the University and the development is in place, it has been stated to be within the spirit of the Regulations. Therefore, it is recommended that the Council requests the submission of additional information as allowed by the Regulations (‘a Regulation 20 request’).

17.0 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Oxford City Council; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.

SLR

global environmental solutions

ABERDEEN
214 Union Street,
Aberdeen AB10 1TL
T: +44 (0)1224 517405

AYLESBURY
7 Wornal Park, Menmarsh Road,
Worminghall, Aylesbury,
Buckinghamshire HP18 9PH
T: +44 (0)1844 337380

BELFAST
Suite 1 Potters Quay, 5 Ravenhill Road,
Belfast BT6 8DN
T: +44 (0)28 9073 2493

BRADFORD-ON-AVON
Treenwood House, Rowden Lane,
Bradford-on-Avon, Wiltshire BA15 2AU
T: +44 (0)1225 309400

BRISTOL
Langford Lodge, 109 Pembroke Road,
Clifton, Bristol BS8 3EU
T: +44 (0)117 9064280

CAMBRIDGE
8 Stow Court, Stow-cum-Quy,
Cambridge CB25 9AS
T: + 44 (0)1223 813805

CARDIFF
Fulmar House, Beignon Close, Ocean
Way, Cardiff CF24 5PB
T: +44 (0)29 20491010

CHELMSFORD
Unit 77, Waterhouse Business Centre,
2 Cromar Way, Chelmsford, Essex
CM1 2QE
T: +44 (0)1245 392170

DUBLIN
7 Dundrum Business Park, Windy
Arbour, Dundrum, Dublin 14 Ireland
T: + 353 (0)1 2964667

EDINBURGH
No. 4 The Roundal, Roddinglaw
Business Park, Gogar, Edinburgh
EH12 9DB
T: +44 (0)131 3356830

EXETER
69 Polsloe Road, Exeter EX1 2NF
T: + 44 (0)1392 490152

FARNBOROUGH
The Pavilion, 2 Sherborne Road, South
Farnborough, Hampshire GU14 6JT
T: +44 (0)1252 515682

GLASGOW
4 Woodside Place, Charing Cross,
Glasgow G3 7QF
T: +44 (0)141 3535037

HUDDERSFIELD
Westleigh House, Wakefield Road,
Denby Dale, Huddersfield HD8 8QJ
T: +44 (0)1484 860521

LEEDS
Suite 1, Jason House, Kerry Hill,
Horsforth, Leeds LS18 4JR
T: +44 (0)113 2580650

LONDON
83 Victoria Street,
London, SW1H 0HW
T: +44 (0)203 691 5810

MAIDSTONE
19 Hollingworth Court, Turkey Mill,
Maidstone, Kent ME14 5PP
T: +44 (0)1622 609242

MANCHESTER
Digital World City, 1 Lowry Plaza,
The Quays, Salford, Manchester
M50 3UB
T: +44 (0)161 216 4064

NEWCASTLE UPON TYNE
Sailors Bethel, Horatio Street,
Newcastle-upon-Tyne NE1 2PE
T: +44 (0)191 2611966

NOTTINGHAM
Aspect House, Aspect Business Park,
Bennerley Road, Nottingham NG6 8WR
T: +44 (0)115 9647280

SHEFFIELD
STEP Business Centre, Wortley Road,
Deepcar, Sheffield S36 2UH
T: +44 (0)114 2903628

SHREWSBURY
2nd Floor, Hermes House, Oxon
Business Park, Shrewsbury SY3 5HJ
T: +44 (0)1743 239250

STAFFORD
8 Parker Court, Staffordshire Technology
Park, Beaconside, Stafford ST18 0WP
T: +44 (0)1785 241755

WORCESTER
Suite 5, Brindley Court, Gresley Road,
Shire Business Park, Worcester
WR4 9FD
T: +44 (0)1905 751310

Industry | Infrastructure | Mining & Minerals | Oil & Gas | Planning & Development | Renewable & Low Carbon | Waste Management