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Environmental Impact Assessment Scoping Report

Cheshunt Lakeside

Delamare Road, Borough of Broxbourne

On behalf of
Inland (Stonegate) Ltd

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1.0 INTRODUCTION

- 1.0.1 This Environmental Impact Assessment (EIA) Scoping Report has been prepared by Metropolis Green on behalf of Inland (Stonegate) Ltd (the Applicant) for the proposed redevelopment of the site at Cheshunt Lakeside, Delamare Road in the Borough of Broxbourne (BoB).
- 1.0.2 The design development for the proposal remains ongoing and subject to change. The current proposal comprises the development of the site to provide a residential-led mixed use 'urban village', containing residential units, commercial space, and a two form entry (2FE) primary school, with landscaping and access arrangements. The approximate parameters of the proposed development are provided in further detail below.
- 1.0.3 Discussions on proposals for the site are currently ongoing between the Applicant and BoB as part of the planning application and local plan process. The Applicant is planning to submit an outline planning application, setting out fixed parameters, for the redevelopment of the site in line with the description of the proposed development outlined as above and further in this report.

1.1 Environmental Impact Assessment Approach

EIA Process

- 1.1.1 EIA is the process through which the likely significant environmental effects of a project can be identified and where possible, adverse effects avoided and mitigated. This process is then reported in the Environmental Statement (ES) which is submitted as part of the planning application.
- 1.1.2 The overall aim of the proposed EIA is to provide an objective and systematic account of the significant environmental impacts of the project, assessing the ability of the site and surrounding area to accept those impacts.

Environmental Impact Assessment Regulations

- 1.1.3 The proposed development is subject to the formal EIA process in accordance with Directive 2011/92/EU of the European Parliament and the *Town and Country Planning (Environmental Impact Assessment) Regulations 2011* (the EIA Regulations).
- 1.1.4 Directive 2011/92/EU of the European Parliament was amended by Directive 2014/52/EU on 16 April 2014. This came into force on 15 May 2014; however, Article 3 of Directive 2014/52/EU provides transitional arrangements for projects. Under the transitional arrangements,

projects for which the screening or scoping was initiated before 15 May 2017 shall be subject to the provisions of Directive 2011/92/EU.

- 1.1.5 The scoping process for the proposed development was initiated through the provision of this report in early May 2017 therefore, the proposed development is subject to the current regime under Directive 2011/92/EU.
- 1.1.6 The requirement for an EIA is based on the test as to whether a development project, by virtue of its nature, size or location is likely to have significant effects on the environment. The principal guidance regarding the requirements for an EIA is found in Schedules 1, 2 and 3 of the EIA Regulations.
- 1.1.7 For development projects that are listed in Schedule 1 of the EIA Regulations, an EIA is a mandatory requirement. Developments listed in Schedule 1 include major projects and infrastructure (e.g. crude-oil refineries, nuclear power plants, railway lines, airports, etc.). The proposed development does not fall under this schedule.
- 1.1.8 For other development projects that do not fall under Schedule 1 of the EIA Regulations, but are found in Schedule 2, applicable thresholds and criteria are also provided to assist in the classification of EIA development. As an “*urban development project*” the proposed development falls under Column 1, Section 10 (b) of Schedule 2 of the EIA Regulations.
- 1.1.9 The EIA Regulations have been amended by the *Town and Country Planning (Environmental Impact Assessment) (Amendment) Regulations 2015* with respect to screening thresholds for urban development projects. The thresholds for the purposes of classifying development as Schedule 2 development under this section are:
- “*The development includes more than 1 hectare of urban development which is not dwelling house development; or*
 - *the development includes more than 150 dwellings; or*
 - *the overall area of the development exceeds 5 hectares”.*
- 1.1.10 The site is approximately 12.18 hectares (ha) and is currently anticipated to accommodate approximately 1,900 residential dwellings in a mixed use urban village. The proposed development therefore exceeds the screening thresholds.
- 1.1.11 Given the nature, scale and location of the Project, the Applicant has concluded that it would be prudent to undertake an EIA. Therefore we have not sought to formally screen the project and as such an ES will be submitted on a voluntary basis.

1.2 Purpose of EIA Scoping Report

- 1.2.1 The EIA scoping process is an important step under the EIA Regulations and is used to address and establish the proposed structure and content of an ES for the proposed EIA development. The scoping process occurs in consultation with the local planning authority (in this case BoB) and a number of consultees, including but not limited to Historic England, the Environment Agency, Natural England, Transport for London and others.
- 1.2.2 A request for a Scoping Opinion has been made to BoB, in accordance with Regulation 13 of the EIA Regulations. This report contains the required information under paragraph 13 (2) (a), including:
- (i) a plan sufficient to identify the land (Appendix A);
 - (ii) a brief description of the nature and purpose of the development and of its possible effects on the environment (Sections 2.0 and 3.0); and
 - (iii) such other information or representations as the person making the request may wish to provide or make (Sections 3.0-5.0).
- 1.2.3 This EIA Scoping Report outlines the proposed structure, content, scope and methodology of the ES for the proposed development, including the various environmental issues to be addressed through the technical chapters.

1.3 Project Team

- 1.3.1 This EIA Scoping Report has been prepared by Metropolis Green on behalf of the Applicant, and in collaboration with the Cheshunt Lakeside Project Team as outlined in Table 1 below:

Table 1: Project Team

Project Team Member	Environmental Issue
Inland (Stonegate) Ltd	Applicant
Metropolis Green	EIA Coordination Energy and Sustainability
Metropolis Architecture Studio	Architecture
Montagu Evans	Planning Townscape, Heritage and Visual Impact Assessment

Project Team Member	Environmental Issue
Entran Ltd	Air Quality Noise
GIA	Daylight and Sunlight
ACD Environmental	Ecology
Fairhurst	Ground Conditions and Contamination
Quod	Socio-Economics
Markides Associates	Transport
Roger Cory Partnership	Water Resources, Flood Risk and Drainage
BMT Fluid Mechanics	Wind Microclimate

2.0 SITE AND PROPOSED DEVELOPMENT

2.1 The Site

- 2.1.1 The site covers an area of approximately 12.18ha, located within Cheshunt, which is situated within the southern area of the Borough of Broxbourne. It is roughly rectangular in shape and is located to the west of, and running parallel to, the West Anglia main railway line, which creates the eastern boundary. Windmill Lane creates the southern boundary, opposite which lies a number of commercial properties and Cheshunt Railway Station. To the northwest, the site is bordered by allotments, whilst Cadmore Lane forms the northern boundary of the site.
- 2.1.2 The existing site provides for a range of employment uses falling within Use Classes B1, B2 and B8 and other sui generis uses. The site also currently includes a number of other non-Class B uses, such as a gym (Use Class D2), residential (Use Class C3) and retail (Use Class A2 and A3) along Windmill Road.
- 2.1.3 The largest single employer on the Cheshunt Lakeside was Tesco Stores Ltd, providing approximately 70% of the total employment by number of jobs within the draft allocation area and approximately 50% of the overall employment floorspace. Tesco vacated Delamare Road at the beginning of 2016 as part of the relocation to their headquarters to Welwyn Garden City.
- 2.1.4 The existing buildings on the site are varied in operation, mass, floorspace and number of storeys. However, the average number of storeys across the site ranges from two to three, with the former Tesco Holdings premises rising to five storeys.

2.2 The Surrounding Area

- 2.2.1 The surrounding area contains a mixture of suburban residential dwellings, industrial and commercial land, and open space.
- 2.2.2 To the east of the site, beyond the West Anglia Main Railway line lies the Lee Valley, which is a designated Special Protection Area (SPA), RAMSAR Site and Site of Special Scientific Interest (SSSI). These sites are illustrated in Appendix B.
- 2.2.3 Cheshunt Railway Station is located to the south of the site on Windmill Lane, on which a number of low rise commercial premises are located, including two public houses. Further south of Windmill Lane, the area becomes residential in nature.

- 2.2.4 The area to the west of the site is residential in nature, containing low rise (predominantly two storey), semi-detached dwellings. The Fielding's Road employment area lies beyond the northern boundary of the site.

Geographical Scope

- 2.2.5 The nature of the current environmental conditions and the manner in which impacts are likely to be generated means the influence of many potential impacts can extend beyond the immediate site boundary. Where identified and relevant, such impacts will be assessed as part of the EIA.
- 2.2.6 The geographical extent of the EIA also considers the potential implications of related and un-related development activities such as the highway improvements required for the EIA proposal.

Environmental Designations

- 2.2.7 The proposed development is adjacent to the Lee Valley SPA, which is also a designated RAMSAR site. The Lee Valley SPA is a series of wetlands and reservoirs that occupy approximately 20km of the valley. The SPA comprises embanked water supply reservoirs, sewage treatment lagoons and former gravel pits that support a range of man-made, semi-natural and valley bottom habitats. These wetland habitats support wintering wildfowl (including Gadwall and Shoveler). Areas of reedbed also support significant numbers of wintering Bittern.
- 2.2.8 Turnford and Cheshunt Pits SSSI is also located adjacent to the proposed development site. The SSSI has a biological designation, and has 4 notified species includes Shoveler, Gadwall and Bittern.

Heritage

- 2.2.9 There are no statutory Listed Buildings within the boundary of the site, nor does it lie within or adjacent to a Conservation Area.

Flood Risk

- 2.2.10 The proposed development lies within the Environment Agency (EA) Flood Zone 2 designation meaning that the land is assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 greater annual probability of flooding from the sea (>0.5%) in any year, ignoring the presence of flood defences.

Other Designations

2.2.11 The site is not defined as a “*sensitive area*” under Regulation 2(1) of the EIA Regulations as it is not located within: a Site of Special Scientific Interest; European Site; National Park; Area of Outstanding Natural Beauty; World Heritage Site or any other relevant designation under the EIA Regulations.

Transport

2.2.12 The site is located in proximity to a number of public transport facilities. Cheshunt Railway Station is located to the southeast of the site and provides links to London Liverpool Street, Cambridge and Stratford. The London Overground also operates from this station and provides links to Central London. Delamare Road, Cadmore Lane and Windmill Lane are not currently served by any bus services; the nearest bus stop is 650m from the southern end of Delamare Road.

2.3 Proposed Development

2.3.1 Metropolis Planning and Design are currently developing a masterplan proposal for the entirety of the site. The following section sets out the key elements of the emerging masterplan proposals, which form the basis of the proposal.

2.3.2 As noted previously, discussions regarding the proposals for the site are ongoing with BoB through the planning pre-application process. For the purposes of the EIA Scoping Report the proposal currently comprises:

- Approximately 1,990 residential units in 11 no. blocks, generally ranging in height from 2 storeys to 8 storeys across the site;
- Commercial floorspace;
- A 2FE Primary School;
- Associated landscaping;
- Car and cycle parking in line with policy requirement; and
- A new vehicular access from Cadmore Lane to the Lee Valley Country Park to be brought forward in connection with the Crossrail 2 proposals, including the closure of level crossings and the four-tracking of the adjacent railway.

2.3.3 A description of the proposed development will be provided within the ES in accordance with Schedule 4 of the EIA Regulations. In line with best practice, the description of the proposed development will also provide sufficient information about how the scheme will work, both during construction and following completion and occupation.

2.4 Consideration of Alternatives

2.4.1 In line with the requirements of Schedule 4 of the EIA Regulations, the ES will provide an outline of the main alternatives studied by the Applicant and Project Team.

2.4.2 The consideration of alternatives will be based on various scenarios, as appropriate for the subject site. These include:

- A 'do nothing' or 'no change' scenario, which considers no development taking place on the subject site;
- An 'alternative sites' scenario, which considers alternative sites for the proposed development (as relevant); and
- An 'alternative designs' scenario, which considers the alternative designs of the proposed development with respect to issues of location, materials, extent, etc. taking into account the environmental effects which influences the design evolution.

2.4.3 A summary of the design objectives/considerations and the evolution of the design of the proposed development for the subject site will be provided in the Alternatives Considered chapter of the ES. This chapter of the ES will address the decision-making process for the selection of the preferred option for the proposed development.

2.5 Type of Application

2.5.1 The details of the proposed development are likely to be submitted in an outline application format, and will be supported by the masterplan and indicative design detail to demonstrate how the development will come forward. The application will provide a sufficient level of detail so that the maximum parameters are identified for the environmental assessment.

2.5.2 The application will be made with some or all of the following matters reserved for determination at a later date:

- **Appearance** – Aspects of a building or place which affect the way it looks, including the exterior of the development;
- **Means of Access** – Covers accessibility for all route to and within the site, as well as the way they link up to other roads and pathways outside the site;
- **Landscaping** – The improvement or protection of the amenities of the site and the areas and the surrounding area, this could include planting trees or hedges as a screen;
- **Layout** – Includes buildings, routes and open spaces within the proposed development and the way they are laid out in relation to buildings and spaces outside the proposed development; and

- **Scale** – includes information on the size of the proposed development, including height, width and length of each proposed building.

2.5.3 The application may be submitted with some or all of these matters dealt with for specific parts of development (such as for an early phase or phases) or in the form of a ‘hybrid application’, where part of the development is shown in full detail, the rest remaining in outline form.

2.6 Planning Policy Context

2.6.1 Section 38 of the Planning and Compulsory Purchase Act 2004 requires planning applications to be determined in accordance with policies of the adopted statutory Development Plan, unless material considerations indicate otherwise.

2.6.2 In this instance, the Development Plan consists of:

- Local Plan 2005 saved policies (December, 2008)

2.6.3 The Borough of Broxbourne have also implemented interim policies to reflect changes in National Planning Guidance. The relevant policies are listed below:

- Interim Policy for Residential Car Parking Standards; and
- Interim Policy for Non-Residential Car Parking Standards.

2.6.4 Within the adopted Local Plan, the site is designated as an employment area. Local Plan Policy EMP1 sets out that non Class B will only be permitted in certain limited circumstances and not where they ‘would have an adverse effect upon the provision of employment land’.

Emerging Local Plan

2.6.5 The Borough of Broxbourne is currently in the process of preparing a new Local Plan. Public consultation took place on the Regulation 18 draft Local Plan from 18 July – 16 September 2016.

2.6.6 The Council’s Local Development Scheme (February 2016) sets out a timetable for the adoption of the Local Plan and sets out that that the draft Local Plan will be submitted to the Inspectorate for an Examination in Public in September 2017 with the Examination hearing starting in July 2017. The target date for adoption is December 2017.

2.6.7 Considering the context of the emerging Local Plan, which sets out the Council’s strategy on housing land supply, a degree of weight should be attributed to it in planning decisions. The weight that the Local Plan, and the site allocation, is given will increase as it moves through the stages to formal adoption.

2.6.8 Within the emerging Local Plan, the site is allocated for a mixed-use urban village development under emerging Policy CH1.

2.6.9 Draft Policy CH1 Cheshunt Lakeside states that:

“Cheshunt Lakeside will be developed as a new mixed use urban village to accommodate:

- *c. 1,000 new homes;*
- *20% starter / shared ownership homes;*
- *20% affordable rented homes;*
- *Elderly persons accommodation;*
- *Businesses and business floorspace for new business start-ups;*
- *A local centre, situated along Windmill Lane, connecting Cheshunt Lakeside to Cheshunt Railway Station;*
- *A two form entry primary school;*
- *Landscaped open space, and*
- *Relocation of Network Rail depot.*

A section 106 agreement will accompany a future planning permission and proportionate contributions will be allocated to priorities within the Infrastructure Delivery Plan.

Cheshunt Lakeside is to be developed in accordance with a comprehensive master plan. Incremental development of the area will be resisted.

If necessary, compulsory purchase will be pursued by the Council.”

2.6.10 A number of comments have been made on the detailed terms of the draft allocation which are to be taken into account by BoB in the next stage draft (Regulation 19) Local Plan. On the whole, however, the proposed allocation is supported in principle as it reduces the demand on the Council to release additional land from the Green Belt for housing development to meet the Council’s need for a housing land supply.

Other Material Considerations

2.6.11 The National Planning Policy Framework (NPPF) provides overarching national policies and is a material consideration in the determination of planning applications.

2.6.12 Other material documents are the Borough-wide Supplementary Planning Guidance (SPG) (adopted in 2004 and updated in 2013).

3.0 PROPOSED SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

3.0.1 The ES for the proposed development will be prepared in line with Part 1 of the EIA Regulations which states that “environmental statement” means a statement—

- (a) that includes such of the information referred to in Part 1 of Schedule 4 as is reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile, but
- (b) that includes at least the information referred to in Part 2 of Schedule 4.

3.0.2 As noted above, Schedule 4 of the EIA Regulations sets out the information to be included in an ES. In summary, this information includes, but is not limited to:

- a description of the development;
- a description of the measures to avoid, reduce and/or remedy significant adverse effects;
- the data required to identify and assess the main effects which the development is likely to have on the environment;
- an outline of the main alternatives studied by the Applicant; and
- a non-technical summary of the information provided above.

3.0.3 The environmental issues considered relevant to the ES for the proposed development are listed below. It is proposed that each issue is addressed through an individual technical chapter within the ES:

- Air Quality;
- Daylight and Sunlight;
- Ecology;
- Ground Conditions and Contamination;
- Noise;
- Socio-Economics;
- Townscape, Heritage and Visual Impact Assessment;
- Transport;
- Water Resources, Flood Risk and Drainage; and
- Wind Microclimate.

3.0.4 The environmental issues noted above have been scoped into the assessment following pre-application advice given by BoB. As well as this, the Project Team have reviewed the existing conditions of the site and surrounding area, the statutory requirements, planning policy and guidance documents, and have prepared the relevant preliminary desk-based or site survey studies, resulting in these topics being scoped into

the ES. It is the determination of the Project Team that there are potentially significant environmental impacts associated with these issues and that these topic areas should be addressed as technical chapters of an ES for the proposed development.

- 3.0.5 In accordance with standard practice at the Scoping Stage, the Applicant and Project Team are seeking confirmation from BoB regarding the environmental issues to be scoped into the EIA.
- 3.0.6 The environmental issues that are not considered to be significant for the site or proposed development are listed below. It is proposed that these issues are scoped out of the EIA and will not be included as individual technical chapters within the ES:
- Archaeology;
 - Energy and Sustainability;
 - Telecommunications and Electronic Interference; and
 - Waste.
- 3.0.7 Sections 3.1-3.3 of this report below outline the proposed EIA methodology, approach to cumulative impact assessment, construction parameters, and introductory sections of the ES.
- 3.0.8 Sections 3.4-3.14 below provide the proposed scope and methodology of the various technical chapters listed above.
- 3.0.9 Lastly, Section 3.15 below outlines the summary sections and the proposed structure of the individual ES technical chapters.
- 3.0.10 Non-significant environmental issues to be scoped out of the ES are addressed separately in Section 4.0 below.

3.1 EIA Methodology

Project Parameters

- 3.1.1 In order for the significant environmental effects of the project to be identified and assessed, it is necessary to clearly identify all the components of the proposed development. However, in many cases, the details of the development have not yet been decided at the Scoping stage and are reserved for later consideration by the Applicant and the Local Planning Authority.
- 3.1.2 In order to enable the consideration of the scope of the potential effect of the demolition, construction and operation of the proposed development, the EIA proposals at this stage will be described at a high level.
- 3.1.3 Parameter plans are typically used in the assessment of an outline planning application.

3.1.4 In undertaking the assessment of the EIA, parameters will be fixed which allow for flexibility of the project within defined limits. Such parameters include building heights, locations, floorspace for particular use classes and residential unit numbers and sizes. These will be outlined as maximum in order to provide assessment of the worst case. This allows the inherent flexibility for future applications within these parameters. This is known as the 'Rochdale Envelope'.

EIA Methodology

3.1.5 The EIA will be completed in line with statutory requirements and guidance, and the contents of the ES will be prepared in line with the EIA Regulations, as discussed previously. The technical chapters of the ES will address the potentially significant environmental impacts, as determined through site analysis completed to date and as outlined further in this EIA Scoping Report.

3.1.6 The EIA will address the potential environmental impact and effects of the proposed development. Where appropriate, the following categories of effects will be analysed:

- residual and cumulative;
- temporary and permanent; and
- beneficial and adverse.

3.1.7 The ES will provide a description of the baseline environment(s) against which the environmental impacts will be assessed and a description of the proposed development. It is considered that for the proposed development site the baseline environment comprises the vacant site with the existing surrounding land uses and buildings.

3.1.8 The significance criteria used in the EIA will be described within each technical chapter and will be based on relevant standards, criteria, guidance and statutory requirements, where applicable. Where possible, quantitative analysis will be utilised, with qualitative analysis undertaken where this is not possible, in line with professional judgement. For consistency and where possible within the technical chapters of the ES, the significance level of quantitative and qualitative impacts will reference impact criteria as follows:

- major;
- moderate;
- minor; and
- negligible.

3.1.9 Each of the technical chapters of the ES will outline the appropriate mitigation measures which are recommended or required to address, reduce or avoid the significant adverse impacts on the environment. These mitigation measures will also be summarised in the ES.

Consultation

3.1.10 In accordance with Regulation 13 (4) of the EIA Regulations, it is anticipated that BoB, as the Local Planning Authority, will request statutory consultees and other relevant parties and agencies to comment on the proposed scoping and content of the ES for the proposed development. The relevant consultees are anticipated to include, but are not limited to:

- Historic England;
- Environment Agency (EA);
- Highways England;
- Natural England; and
- Transport for London (TfL).

3.1.11 Expected consultees for each of the relevant environmental issues, as well as any consultation that has taken place as part of the scoping process, have been outlined and noted within the proposed scope of the various technical chapters noted below.

Extent of the Outline Application

3.1.12 Inland (Stonegate) Ltd are currently developing a masterplan which will set out how the development of the site will come forward. The masterplan continues to be developed in discussion with senior BoB officers and will inform the scope and parameters of the outline application for the entirety of the site allocation CH1 area.

3.1.13 As discussed previously, the application will be in outline format and therefore details of appearance, means of access, landscaping, layout and scale may be reserved for future consideration pursuant to detailed 'reserved matters' applications. The reserved matters applications will be controlled and informed by the masterplan design parameters and design code requirements controlled by the conditions of the outline consent.

Main Sensitive Receptors

3.1.14 This EIA Scoping Report has been produced at an early stage in the EIA process, and the main sensitive receptors for the environmental issues listed in the Sections below (3.4-3.13) have been identified to the extent feasible. It is accepted that not every receptor has yet been identified and further work and consultation is required through the scoping process and the preparation of the EIA itself.

3.2 Cumulative Impacts

3.2.1 The final list of cumulative developments is subject to further agreement with BoB. The screening criteria which have been used by the Project Team with respect to cumulative developments are outlined below:

- Development projects located within 1 kilometre of the proposed development;
- Development projects which are under construction, with extant planning permission, with a currently submitted planning application, or subject to another statutory process;
- Development projects which are expected to generate their own residual impacts on the environment of at least minor significance (i.e. major developments);
- Development projects spatially linked to the proposed development (i.e. within views, in the same local economic area, utilising the same local road network, etc.); and
- Development projects with construction periods expected to overlap with the proposed development.

3.2.2 The Cumulative Impacts chapter of the ES will summarise the cumulative impacts of the proposed development, associated with the combined individual environmental impacts (Type 1 effects) and the impacts in combination with other consented and proposed developments in proximity to the site (Type 2 effects).

3.2.3 Regarding the cumulative assessment for Traffic and Transport, the highways assessment will include ‘committed’ developments which are development sites that have either been submitted for planning and have a TA or have been approved but not yet constructed. The approach to the cumulative assessment will be discussed further with BoB and the Highways Agency.

Committed Development

3.2.4 European guidance on cumulative impacts (Document EC DH XI) “*Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*” (May 1999) defines cumulative impact as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”.

3.2.5 The guidance goes on to state that:

“Activities in the past, present and future can all have a bearing on the project being assessment and will influence the time frame set for the EIA. Setting time frame “boundaries” will allow for the inclusion of past and future developments which could lead to indirect or cumulative impacts or impact interactions...”

In practical terms the extent of the assessment in terms of how far into the past and into the future will be dependent upon the availability and quality of information. Past activities can

often be identified from historical maps, present activities from current maps and future development activities from development plans...

In setting the future time boundary it is suggested that in general beyond 5 years there is too much uncertainty associated with most development proposals...

...it is only reasonable to consider current events and those that will take place in the foreseeable future. Furthermore, the assessment can only be based on the date that is readily available. There needs to be a cut off point at which it can be said that the impacts cannot be reasonably attributed to the project."

3.2.6 The cumulative impact assessment will be considered in the following categories:

- Combined Effects of Individual Impacts – (arising from the project on a potential receptor. I.e. noise and dust on a single receptor); and
- Combined Effects with Other Developments.

3.2.7 In respect of potential cumulative effects with other developments in the National Planning Policy Framework (NPPF) provides Planning Practice Guidance and states:

"Each application (or request for a screening opinion) should be considered on its own merits. There are occasions where other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development. There could also be circumstances where two or more applications for development should be considered together. For example, where the applications in question are not directly in competition with one another, so that both or all of them might be approved, and where the overall combined environmental impact of the proposals might be greater or have different effects than the sum of their separate parts."

3.2.8 Therefore it is considered that a robust cumulative assessment will account for any existing or approved developments (i.e. anything with planning permission) and any application which could give rise to cumulative impacts.

3.2.9 It is considered that any significant cumulative effects are likely to be limited to Air Quality, Ecology, Townscape, Heritage and Visual, Socio-Economics and Traffic and Transport. It is proposed that assessments of the potential for cumulative effects are made within the relevant technical chapters of the ES.

3.2.10 The scope of committed developments to be assessed within the cumulative assessment will be agreed with BoB in advance of the assessment.

3.3 Introductory Chapters

3.3.1 The ES will include a Non-Technical Summary (NTS), prepared in accordance with Schedule 4 of the EIA Regulations.

3.3.2 The Introduction and EIA Methodology chapters of the ES are proposed to include:

- the statutory context of the document;
- information regarding the scope of the document (to be determined through this scoping process);
- a description of the existing environment on the subject site;
- details of the planning application;
- an overview of the Project Team;
- an outline of the content of the ES; and
- the overall EIA methodology.

3.3.3 The Alternatives Considered chapter will be prepared in accordance with Section 2.3 above.

3.3.4 A detailed description of the proposed development will be presented in the Proposed Development chapter, in line with the requirements of the EIA Regulations (see paragraph 2.2.3 above).

3.3.5 Further details regarding the proposed overall structure of the ES can be found in Section 5.0 of this report below.

3.4 Air Quality

3.4.1 The Air Quality chapter of the ES will consider the potential impacts of the proposed development on local air quality during both construction and operational phases. The assessment will be undertaken by Entran.

Scope and Issues

Baseline Environment

3.4.2 BoB has declared three Air Quality Management Areas (AQMA) within the borough. The proposed development site is not located within any of the AQMAs, the closest is located 1.6km to the south of the site.

- 3.4.3 An initial review of the monitoring undertaken by BoB indicates that the relevant air quality objectives are currently being exceeded at locations immediately adjacent to the main roads. However, the targets are being met at locations further from the main roads. Background concentrations in the vicinity of the site also meet the relevant air quality objectives.
- 3.4.4 The key source of emissions to air in the borough are emissions from road traffic. Along the eastern boundary of the site is an electrified railway line, which is likely to support diesel traffic. Defra have produced a guidance note for local authorities to assist in their review and assessment work. This guidance note 'Local Air Quality Management Technical Guidance' (LAQM.TG(16))¹ provides a list of rail lines with sufficiently heavy traffic of diesel passenger trains, which require further assessment. The railway line bordering the site is not included in this list. It is considered the railway line is not a significant source of emissions to air and will not be included in the modelling. There are no significant industrial sources of emissions to air in the vicinity of the site.

Assessment Methodology

Construction Methodology

- 3.4.5 To assess the impact to local air quality during the construction phase, the following scope of works will be undertaken:
- An assessment of the impacts of dust and particulate matter generated during the demolition and construction phase will be undertaken following the methodology provided in the guidance document published by the Institute for Air Quality Management (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction, Version 1.1'.
- 3.4.6 A qualitative assessment of the emissions arising from the exhausts of construction traffic and plant during the construction phase will be undertaken, taking the following into consideration:
- The number and type of plant to be used;
 - The daily number of HGV deliveries;
 - The size of the site;
 - The proximity of sensitive receptors; and
 - Local meteorological conditions.

Operational Methodology

- 3.4.7 To assess the impact to local air quality during the operational phase, the following scope of works will be undertaken:

¹ Defra (2016). Local Air Quality Management Technical Guidance (TG16)

- Review available information relating to the existing air quality, including local pollutant monitoring data and local authority review and assessment reports in order to establish the existing background concentrations in the vicinity of the site;
- Detailed modelling of emissions to air arising from road vehicles using the detailed dispersion model ADMS-Roads. The model will be used to predict concentrations of relevant pollutants (namely nitrogen dioxide and particulate matter) at selected receptor locations both with and without the proposed development in operation. The results of the modelling will be added to the established background concentrations to predict the overall pollutant concentrations which will be compared to the relevant assessment levels;
- The ADMS Road model will be verified against existing monitoring data in the vicinity of the site (where relevant data exists). It is not anticipated at this stage to carry out further air quality monitoring; and
- If the proposals are to include significant energy generating plant such as a CHP plant or similar, detailed modelling of the emissions to air will be completed using the detailed dispersion model Aermid.

Assessment Criteria

- 3.4.8 The significance of the impacts will be determined using the significance criteria outlined in the IAQM and Environmental Protection UK (EPUK) guidance document 'Land-Use Planning & Development Control: Planning for Air Quality'.

3.5 Daylight and Sunlight

- 3.5.1 Given the scale and design of the proposed development, along with its proximity to potentially sensitive receptors, a daylight, sunlight and overshadowing assessment is considered necessary. This assessment will be undertaken by GIA.

Scope and Issues

Daylight and Sunlight

- 3.5.2 In terms of the daylight and sunlight analysis the scope will focus on the adjoining residential properties where the occupants have a reasonable expectation of daylight and sunlight as per the BRE Guidelines.

3.5.3 Residential receptors located on the following roads have been identified as sensitive in relation to daylight and sunlight and will therefore be included within the assessments:

- Cadmore Lane;
- Palmers Way;
- Clifton Close;
- Oakdene;
- Windmill Lane; and
- Greenall Close.

Overshadowing

3.5.4 In terms of the daylight and sunlight analysis the scope will focus on the adjoining residential properties where the occupants have a reasonable expectation of daylight and sunlight as per the BRE Guidelines.

3.5.5 Residential receptors located on the following roads have been identified as sensitive in relation to daylight and sunlight and will therefore be included within the assessments:

- Palmers Way;
- Clifton Close;
- Oakdene;
- Windmill Lane; and
- Greenall Close.

Light Pollution

3.5.6 Light pollution is typically considered an issue where light is emitted from artificial sources, such as highly glazed commercial offices, into residential accommodation where this would cause a nuisance to occupants.

3.5.7 The proposed development includes commercial uses in the southern part of the site, where there is the potential for the use of extensive artificial lighting. In addition, proposed external lighting on the eastern side of the masterplan site may interact with sensitive receptors within the neighbouring Lee Valley Regional Park. However, as the application is outline in nature detailed lighting designs will not be available for the external and commercial lighting, therefore it will not be possible to assess the proposed development for light pollution effects.

Solar Glare

3.5.8 The BRE guidelines provide that '*glare or solar dazzle can occur when sunlight is reflected from a façade or area of metal cladding*'. This is considered an issue in relation to road users and train drivers whereby

an instance of reflection can obscure the view of traffic/rail signals and thus have the potential to cause an accident.

- 3.5.9 However, the planning application is outline in nature and therefore details of the façade materials including glazing are not available for a full detailed solar glare analysis to be undertaken. This will form part of a reserved matters application which will include a solar glare analysis on the nearby sensitive road junctions and train tracks if considered necessary (i.e. large areas of glazing).

Internal Daylight, Sunlight and Overshadowing

- 3.5.10 The assessment of daylight, sunlight and overshadowing within the proposed development will not form part of the ES chapter, but will be presented as a separate standalone report submitted with the planning application.

Assessment Methodology

- 3.5.11 The assessments will be carried out in accordance with the BRE Guidelines 2011 and the British Standard (2008) 8206 part 2. The analysis will be calculated from a 3D computer model based upon specialist software.

Daylight and Sunlight

- 3.5.12 In line with the BRE Guidelines, both the Vertical Sky Component (VSC) and No Sky Line (NSL) assessments will be undertaken for the baseline, proposed development and cumulative scenarios for all of the sensitive receptors identified above.
- 3.5.13 The sunlight amenity to the surrounding receptors will be considered by reference to the Annual Probable Sunlight Hours method of assessment. Due to the southerly rotation of the sun, this assessment will consider those windows which face the site and are located within 90 degrees of due south.
- 3.5.14 The significance of effects will be determined using professional judgement and by reference to Appendix I of the BRE Guidelines.

Overshadowing

- 3.5.15 The overshadowing analysis on surrounding areas of amenity space will be undertaken by reference to Sun Hours on Ground (SHOG) and Transient Overshadowing (TOS) methods of assessment.
- 3.5.16 The SHOG Assessment considers the proportion of a designated amenity space which receives 2 hours of direct sunlight. The BRE provide numerical criteria for the Sun Hours on Ground assessment and where the results show compliance, the potential effect will be

considered to be negligible. Where the effects are beyond the BRE guidelines, professional judgement will be used to establish whether a potential effect would be either beneficial or adverse and the degree of the significance of the effect.

3.5.17 For the TOS assessment, the path of shadow will be mapped for each of the Scenarios on the following dates as suggested by the BRE:

- 21st March (Spring Equinox)
- 21st June (Summer Solstice)
- 21st December (Winter Solstice)

3.5.18 The BRE Guidelines do not provide any specific criteria for TOS other than to establish the time of year and day when shadow will be cast on the surrounding areas of amenity space. Professional judgement will be used to establish whether a potential effect would be either beneficial or adverse and the degree of the significance of the effect.

3.6 Ecology

3.6.1 This chapter considers the ecological receptors within the site and the wider landscape. The potential impacts of the proposed development on these ecological receptors has been outlined. In addition, the assessment criteria and methodology are outlined. This assessment will be undertaken by ACD Environmental.

Scope and Issues

Baseline Environment

3.6.2 An Extended Phase I Habitat Survey of the site and desktop survey, consisting of a 5km search for statutorily designated sites and a 2km search for non-statutorily designated sites and protected species, has been completed.

3.6.3 The site is entirely hard landscaping and buildings and therefore is assessed as being of low ecological value. Given the permanence of the habitats within the site this evaluation is unlikely to change. However, within the site the following ecological receptors are present:

- The buildings within the site have the potential to support bat roosts; and
- The buildings within the site have the potential to support nesting birds.

3.6.4 Adjacent to the site the following ecological receptors are present:

- The railway and allotments may support reptile populations. The desktop survey has returned records of common lizard *Zootoca vivipara* and grass snake *Natrix natrix* along the railway line and

at Lee Valley SPA, RAMSAR and SSSI, respectively. Therefore, it is expected that these reptile species are likely to be present along the adjacent railway line and potentially within the adjacent allotments. Common lizard are widespread but in general decline in the UK. Grass snake are widespread but in general decline in the UK; and

- The adjacent railway line may represent a significant bat commuting corridor. The desktop survey indicates the presence of eight bat species within the local area. These species and their population trends (taken from the Bat Conservation Trust) are as follows: common pipistrelle *Pipistrellus pipistrellus* (widespread in England, increasing); soprano pipistrelle *Pipistrellus pygmaeus* (widespread in England, increasing); Nathusius's pipistrelle *Pipistrellus nathusii* (rare in the UK, population trend unknown); brown-long eared bat *Plecotus auritus* (widespread in England, stable population); Daubenton's bat *Myotis daubentonii* (widespread in England, stable population with a potential increase); serotine *Eptesicus serotinus* (widespread in England, potentially a stable population); and noctule *Nyctalus noctula* (widespread in England, stable population).

3.6.5 Within the wider landscape the following ecological receptors are present:

- Lee Valley SPA, RAMSAR and SSSI. In summary, the sites are designated for their standing open water habitats, which support the following Annex I and II species: bittern *Botaurus stellaris*, gadwall *Anas strepera* and Shoveler *Anas clypeata*. Based on the Turnford and Cheshunt Pits SSSI unit conditions the SPA, RAMSAR and SSSI is currently in a favourable condition, with no identified threats across eight units and one unit with a medium threat risk (threat details are not provided). Bittern are distributed across southern England, mainly East Anglia and Lancashire and have an amber conservation status in the UK (British Trust for Ornithology; BTO). Gadwall are distributed across England, Ireland and part of Scotland and have an Amber Conservational Status in the UK (BTO). Shoveler are distributed across England, Ireland and parts of the UK and have an Amber Conservational Status in the UK (BTO). The conservational objectives of the SPA and SSSI are to maintain the favourable conservational status of the habitats and species included within the designation;
- Wormley-Hoddesdonpark Woods Special Area of Conservation (SAC) and Wormley-Hoddesdonpark Woods South SSSI. The site is designated for its sub-atlantic and medio-European oak or oak-hornbeam forests of the carpinion betuli. The site is currently in a favourable condition, with seven units out of eight

in a favourable condition and one in an unfavourable – no change condition. Medium threats have been identified which can be summarised as sycamore encroachment, scrub encroachment and the dumping of materials. The conservational objectives of the SAC and SSSI are to maintain the favourable conservational status of the habitats and species included within the designation;

- An additional three SSSIs are located within the wider landscape. They are designated for their broadleaved, mixed and yew woodland; standing open water and canal and rivers and streams interest. The condition of these SSSI is a mixture of unfavourable – no change, favourable and favourable recovering. The conservational objectives of the SSSIs is to maintain the favourable conservational status of the habitats and species included within the designation; and
- A total of two Local Nature Reserves are located within the wider landscape. They include woodland and grassland habitats. They are designated for public appreciation and enjoyment of wildlife.

3.6.6 The following ecological receptors are not anticipated to be in the local area and are not discussed within this chapter: amphibians; badgers *Meles meles*; dormice *Muscardinus avellanarius* and water vole *Arvicola amphibius*.

Assessment Methodology

3.6.7 This scoping assessment has been carried out using the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (2016).

3.6.8 Firstly, the species or habitats must be valued and a commonly used framework involves assigning a level of geographical importance to ecological receptors.

3.6.9 Next, the impacts of the proposed scheme have to be predicted, taking into account different stages and activities within the development process. These impacts then have to be assessed for their significance, based upon the value of the species or habitat in question.

3.6.10 The value of specific ecological receptors (sites, habitats or species) is assigned according to their level of importance using the following terms: International value; UK Value; National value; Regional Value; County Value; District Value; Local Value and of Value Within the Zone of Influence.

- 3.6.11 The following factors are considered when ecological effects are significant: Extent; Magnitude; Duration; Reversibility; Timing and frequency and Cumulative effects.
- 3.6.12 In accordance with the current CIEEM guidance and terminology, a significant effect, in ecological terms, is defined as an effect (adverse or positive) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, including cumulative effects. This means that a significant effect is one that causes a change in level of value of a habitat or species, e.g. an adverse effect that reduces the value from County to District level or a positive effect that increases value from District to County level.
- 3.6.13 Non-significant effects (referred to as 'negligible') are those changes that do not cause an effect (adverse or positive) on the integrity of a site or ecosystem, or the conservation status of the habitat or species in question; that is, the effect is not sufficiently large to cause a change in level of value. For example, a habitat of District value subject to a non-significant positive effect, would be enhanced (such as through more suitable management, additional planting, bat boxes on trees, etc), but not to the extent that raised its value to that of County level.
- 3.6.14 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. For instance, a habitat of County value may not be affected, although a population of a species of Local value that is supports could be affected.
- 3.6.15 In accordance with the CIEEM methodology, the value of any feature that will be significantly affected is then used to identify geographical scales 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 of importance at one level would be likely to trigger related planning policies and, if permissible, generate the need for development control mechanisms as described in those policies.
- 3.6.16 The site survey was carried out in line with JNCC's Handbook for Phase I Habitat Survey: A Technique for Environmental Audit guidelines. Various best practice guidance documents have also been consulted for technical knowledge of each protected species.

Assessment Criteria

- 3.6.17 The site and surrounding area may support protected species (reptiles, nesting birds and bats). Whilst the presence of protected species is a material concern, it is considered that the proposed development will be able to provide adequate mitigation to avoid harming the

conservational statuses of these species. Therefore, the potential presence of bat roosts within the buildings, nesting birds within the buildings and reptiles within adjacent habitats will not be discussed any further within this chapter and have been scoped out of the EclA process.

3.6.18 The proposed development has the potential to lead to a significant effect on the nearby SPA and potentially the nearby SAC.

3.6.19 Mitigation in the form of:

- Inclusion of alternative amenity space within the proposed development;
- No net increase in access routes in the SPA;
- Inclusion of information boards to control visitor behaviour;
- Strategic planting within the landscape scheme;
- Avoidance of the use of herbicides, pesticide and fertilisers; and
- Provide supporting green infrastructure within the site.

3.6.20 Consultation with relevant stake holders (Natural England, Broxbourne Council and Lee Valley Regional Park Authority) will be required to outline and confirm the mitigation above. These discussions are likely to lead to the agreement of: (1) strategies to avoid or minimise any negative impacts and (2) ways of compensating for any significant negative residual effects.

3.7 Ground Conditions and Contamination

3.7.1 This chapter provides a preliminary assessment of the ground conditions and potential for contamination and the potential impact on the site and surrounding environment during demolition, construction and operational phases of the proposed development. This assessment will be undertaken by FairhurstGGA.

Scope and Issues

Baseline Environment

3.7.2 FairhurstGGA have previously undertaken a 'Geotechnical & Geo-Environmental Feasibility Study' for the site (reference: 116751/R1/September 2015) which has been used to provide preliminary information for the Scoping Report.

Geology

3.7.3 British Geological Survey Map (BGS) 1:10,000 map extracts provided within a site specific Envriochek Report and BGS published geological drift map (reference Sheet 239, Hertford) have been reviewed. It is

noted that while the geological maps have not recorded Made Ground deposits, given the on-site development, it is likely that man-made and/or reworked deposits of variable depth and heterogeneous properties will be present across the site.

- 3.7.4 Available BGS borehole records from within 150m of the site indicate that the base of alluvial deposits has been recorded to approximate depths of between 4m and 8mbgl. In turn the London Clay Formation is recorded to proven depths of between 12m and 14mbgl. The base of the Lambeth Group has been recorded at c. 26m to 30mbgl, in turn underlain by the White Chalk Subgroup, proven to a maximum depth of 76mbgl.

Hydrogeology and Hydrology

- 3.7.5 The deposits which are anticipated to underlie the site, or within the vicinity of the site, have the following aquifer classifications:

- Alluvium – Secondary A Aquifer.
- Kempton Park Gravel Formation (as silt and clay) – Unproductive Stratum.
- Kempton Park Gravel Formation (as sand and gravel) – Secondary A Aquifer.
- London Clay Formation – Unproductive Stratum.
- Lambeth Group – Secondary A Aquifer.
- White Chalk Subgroup – Principal Aquifer.

- 3.7.6 Based upon the information available to date, it is considered likely that local groundwater flow direction will be north to south/southeast, and superficial groundwater is likely to be in hydraulic connectivity with the surrounding surface water features. There may be sub-artesian pressure within a deep groundwater body in the Chalk underlying the London Clay.

Potential Impacts

- 3.7.7 A qualitative preliminary risk assessment and intrusive ground investigations have not been carried out to date. It is considered based on the information available to date, that a number of potentially contaminative land uses exist/have been historically present on site, such as historic dye works, railway infrastructure, engineering works, backfilled pond, substations and electrical transformers, scrap yards, garages/fuel stations and distribution centres. As such, there is the potential for contamination to be present. However, given the site has predominantly been in use for light industrial warehouses, office buildings and hard standing since the 1960s, it is considered that the presence of widespread contamination on site is of moderate to low risk. Intrusive ground investigation will be required to confirm the extent of contamination on site, and as such, for the purposes of this

assessment, it is assumed that contamination may be present in the soil and groundwater beneath the site. The following will be considered at both construction and operation stage:

- Human Health (High Sensitivity);
- Surface Water (High Sensitivity);
- Groundwater (Medium Sensitivity); and
- Below Ground Structures and Services (Medium Sensitivity).

Assessment Methodology

3.7.8 In accordance with industry best practice document, CLR11 Model Procedures for the Management of Contaminated Land (2004), a Tier 1 Preliminary Risk Assessment (PRA) should be undertaken to qualitatively assess the potential risks to on and offsite receptors associated with the proposed development. Consultations with the appropriate Regulators should be undertaken as part of the PRA to identify any further pertinent environmental information. Thereafter, it is considered that a Phase II intrusive ground investigation would be required to provide a targeted assessment of the geo-environmental risks to identified receptors, and to allow consideration of the relatively paucity of sources of contamination and associated viability of pathway linkages. This will allow a Tier 2 quantitative assessment of the possible risks, in line with current best practices and guidance.

3.7.9 It is considered that risks with respect to ecology, invasive species and flooding should be considered via specialist consultants, and associated risk assessments undertaken where required.

3.7.10 Following completion of the Tier 2 assessment, where risks are identified it will be necessary to undertake an options appraisal and remedial strategy design to allow implementation of mitigation measures to reduce the potential risks to acceptable levels. Additionally, contractors on site will be required to produce risk assessments, methods statements (RAMS) and construction management plans (CMP) if contaminants and potential source-pathway-receptor linkages are realised. It is considered likely that the majority of potential significant impacts during both construction and operational phases can be adequately mitigated with an appropriate remedial strategy and construction management practices.

3.8 Noise

3.8.1 The Noise chapter of the ES will consider the key noise impacts associated with the proposed development. The assessment will be undertaken by Entran.

Scope and Issues

Baseline Environment

- 3.8.2 Existing baseline noise and vibration levels will need to be established in order to assess the effects of the proposals. Entran will liaise with BoB to agree suitable noise monitoring locations, and assessment methodology.
- 3.8.3 Measurement of baseline conditions will be made using a combination of attended survey and long-term unattended measurement techniques as necessary at representative positions. The noise parameters $L_{Aeq,T}$, $L_{A90,T}$, $L_{A10,18hr}$ and L_{Amax} will be monitored and the relevant values obtained for the standard measurement periods. Vibration levels (e.g. Vibration Dose Values and Peak Particle Velocity) will be measured adjacent to the railway and if appropriate adjacent to the network roads.
- 3.8.4 Baseline surveys will be undertaken on the site boundaries adjacent to the nearby roads/railway, adjacent to any existing sensitive properties and along the proposed entrance and exit routes to the site, in order to identify existing noise levels.

Assessment Methodology

Construction Methodology

- 3.8.5 With respect to the prediction of impacts, construction noise will be estimated using the approach set out in BS5288:2009+A1:2014 'Construction Code of Practice for noise & vibration control on construction & open sites'. At representative locations around the development site, the potential noise and vibration impacts of construction works will be predicted and assessed, this will include site clearance works and those due to construction traffic.

Operational Methodology

- 3.8.6 The effect of the noise from the traffic on local roads generated by the proposed development will be assessed at nearby sensitive locations. Predictions will be carried out in accordance with the Calculation of Road Traffic Noise (CRTN 1988) document and will be based on the likely traffic flows forecast for the surrounding road network. Information on the proportion of heavy goods vehicles, the average speed of the vehicle flow, surface and any changes to the road layout will be established. Predictions will be compared against the existing levels of noise determined during the baseline survey. The likelihood of disturbance to residents living nearby will be determined by assessment against the criteria contained with the Design Manual for Roads and Bridges (DMRB) and other relevant standards and guidelines, such as those outlined above. In terms of site suitability, advice contained in relevant guidance (e.g. WHO, BS8233:2014 'Sound Insulation and

noise reduction for buildings - Code of Practice', BS6472:2008 'Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting') will be applied. BS4142 (BS4142, 2014), which sets out a method to assess whether noise from factories, industrial premises or fixed installations is likely to give rise to an adverse impact on noise-sensitive receptors in the vicinity will also be applied to the non-residential aspects of the development where appropriate.

Assessment Criteria

3.8.7 The assessment criteria will be derived from the following:

- NPPF and Local Policy;
- DMRB;
- BS5228:2009+A1:2014 'Construction Code of Practice for noise & vibration control on construction & open sites';
- BS8233:2014 'Sound Insulation and noise reduction for buildings - Code of Practice';
- WHO Guidance;
- BS4142:2014 'Method for rating and assessing industrial and commercial sound'; and
- BS6472:2008 'Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting'.

3.9 Socio-Economics

3.9.1 The Socio-Economics chapter of the ES will consider the key socio-economic impacts associated with the proposed development. The assessment will be undertaken by Quod.

Scope and Issues

3.9.2 The site is currently occupied by commercial buildings. The socio-economic assessment will need to consider the impact of the proposed development of the site on the existing businesses and jobs on-site. However, given the type and scale of the development proposed and the policy support within the emerging Local Plan (Policy CH1 'Cheshunt Lakeside'), the redevelopment of this site would be expected to be beneficial in terms of socio-economic impacts.

3.9.3 The proposed development is mixed use scheme and introduces residential accommodation to the site. The new population living within the residential development may increase demand for social infrastructure. Therefore the socio-economic assessment will need to assess the level of demand which could arise and assess this against the level of existing capacity within the local area. This will be particularly significant in relation to education, healthcare and open

space. In line with the policy designation for the site, the proposed development includes the delivery of a primary school. The socio-economic assessment will establish if this new facility would mitigate the demand arising from the new housing, and if this new facility would help to meet a wider need within the local area.

- 3.9.4 The commercial floorspace proposed would accommodate new employment within this area. The socio-economic assessment will consider the number and type of jobs likely to be generated within these uses. The assessment will also consider the local employment profile, consider the opportunities for local workers and assess the effect on the loss of the existing jobs and businesses on the site.
- 3.9.5 In addition the redevelopment of this site will improve the physical environment by providing public realm and open space.
- 3.9.6 The socio-economic assessment will consider the potential impacts on the following:
- Employment generated during the construction phase;
 - Loss of existing uses;
 - Employment generated within the end uses of the potential commercial floorspace;
 - Delivery of new homes;
 - Increased residential population;
 - Demand for social infrastructure including education and primary healthcare facilities;
 - Demand for open space and children's playspace; and
 - Additional spending by residents and employees.

Assessment Methodology

- 3.9.7 The socio-economic assessment will, wherever possible, be appraised against relevant national standards such as those provided by the Homes and Community Agency (HCA). Where no standards exist, professional experience and judgement will be applied and justified.
- 3.9.8 The likely sensitive receptors in the local are considered to be:
- Existing local businesses and employees;
 - Existing and future local residents; and
 - Local community facilities.
- 3.9.9 The ES chapter would provide a relevant summary of planning policy and guidance at the local (Cheshunt Central Ward), district (Broxbourne District Council) and regional (East of England) level.
- 3.9.10 The assessment of the baseline conditions and potential impacts will use a number of methodologies, data sources and assumptions. These are set out below:

- The socio-economic baseline will be established using:
 - 2011 Census Data;
 - Business Register and Employment Survey (BRES) (2014);
 - Indices of Multiple Deprivation (IMD) (2015);
 - Claimant Count Data (2016);
- Demolition and construction employment impacts will be assessed using the Construction Industry Training Board (CiTB) Labour Forecasting Tool;
- An estimation and quantification of the population and child yield associated with the completed and operational proposed development. The modelling methodology applied to estimate the population and child yield will be based on research into the Moving Groups Dataset within the 2011 Census. This model takes into consideration the occupation characteristics of different types of housing including the characteristic of houses compared to flats of various sizes (based on number of bedrooms) according to their tenure at the district level for Broxbourne;
- Operational employment impacts will be assessed using the Home and Communities Agency standard job density for commercial floorspace;
- Estimates of spending by newly introduced residents will be calculated using the ONS average annual household expenditure on goods and local services;
- Local spending by those working on-site will be calculated based on a daily expenditure assumption;
- Current capacity in schools surrounding the site will be assessed based on information from Annual Schools Census data and Hertfordshire County Council's published admission numbers;
- Availability of primary healthcare facilities in the local area will be assessed by using published NHS data. This information will be compared with the projected new population in the proposed development to estimate the likely effect of the development on primary healthcare facilities; and
- Provision of open space and child play space will be assessed in line with Broxbourne's Supplementary Planning Guidance 2004 (Updated 2013).

3.9.11 The ES will set out the scale and significance of the effects identified using the significance criteria set out in the ES Methodology.

3.9.12 Any mitigation measures required to address any likely adverse effects would be identified through the assessment. Mitigation, if required, could include the on-site provision of facilities or services to meet additional demand, or off-site mitigation through financial contributions

via the Community Infrastructure Levy (if adopted following Local Plan) and/ or the Section 106 agreement.

- 3.9.13 As this assessment is on an outline application for a largescale strategic development, a detailed phasing assessment will not be undertaken within the socio-economic assessment. A high level consideration of the potential effects on phasing can be included if required.
- 3.9.14 The assessment will include an assessment of the cumulative effect of planned developments in the local area.
- 3.9.15 It is not anticipated that public consultation will be required as part of this assessment.

3.10 Townscape, Heritage and Visual Impact

Introduction

- 3.10.1 The Townscape, Heritage and Visual Impact Assessment (THIVA) provides an assessment of the impact of the proposed development on heritage, townscape and visual receptors. This assessment will be undertaken by Montagu Evans. This assessment will be presented in Volume 3 of the ES.
- 3.10.2 The townscape assessment will consider the proposed development within its urban context, including the buildings the relationships between them, the different types of urban open spaces, including green spaces and the relationship between buildings and open spaces.
- 3.10.3 The built heritage assessment will consider the significance of heritage assets and the impact of the proposed development upon that significance. The application site does not contain any heritage assets, although there are heritage assets in the wider area and the THIVA assesses the potential for the proposed development to impact their setting.
- 3.10.4 The visual assessment will consider the impact of the proposed development upon visual receptors, informed by verified views. Viewpoint locations have been informed by architectural and historic accounts of the area, an appraisal of the existing site and surroundings, and relevant policy designations. The view locations are to be agreed with BoB.

Scope and Issues

Baseline Environment

- 3.10.5 The east side of the railway track falls within Green Belt. It incorporates the Turnford and Cheshunt Pits Site of Special Scientific Interest and Thistly Marsh and Area West of Cheshunt Marsh.

- 3.10.6 Whilst not restricted by Green Belt policy restrictions, the proposed development should seek to maximise the relationship with this area of open space and minimise the perceived impact on openness. The proposed development will need to consider the effect on nearby open space contained within Lee Valley Regional Park to the immediate east.
- 3.10.7 There are no heritage assets located in the site boundary or located adjacent to the site. The Interim Policy for Locally Listed Buildings – Local List adopted (Dec 2011) does not identify any non-designated heritage assets on the site.
- 3.10.8 To the west, within the residential conurbation, there are two Grade II listed buildings within a 500m radius of the site boundary; the Belle Vue and 61/63 Windmill Lane, both of which are low-rise residential properties.
- 3.10.9 To the east, also within a 500m radius, is the World War II Bofors Anti-aircraft gun platform 340m, identified as a Scheduled Ancient Monument. The gun platform is located in the Lee Valley, adjacent to the Waltham Abbey Royal Gunpowder Factory, also identified as a Scheduled Ancient Monument.
- 3.10.10 The assessment will need to consider the impact of the proposed development upon the setting of these heritage assets.

Assessment Methodology

- 3.10.11 The methodology for assessment will be based upon:
- The Guidelines for Landscape and Visual Impact Assessment (GLVIA3);
 - Historic England's The Setting of Historic Assets: Historic Environment Good Practice Advice in Planning (GPA3); and
 - Historic England's Conservation Principles Policies and Guidance.
- 3.10.12 The assessment will:
- Identify the existing townscape character and visual quality of the site and surrounding area through desk-based analysis and field study;
 - Evaluate changes to townscape quality and character;
 - Evaluate potential effects on the setting of relevant heritage assets including conservation areas and listed buildings;
 - Provide a qualitative assessment of the potential effects of the proposed development on selected views which have been agreed with BoB, using verified Accurate Visual Representations (AVRs) of the proposed development. An AVR

from Lea Valley Regional Park has been requested by BoB, this can be included; and

- Key townscape features would be evaluated and a classification made of their sensitivity to change. A qualitative assessment of the proposed development and its effects on the existing townscape character, visual context and built heritage would be undertaken. The nature, extent and significance of the effects will be determined by professional judgement and in accordance with relevant planning policy and guidelines, and where necessary, mitigation measures would be identified.

Geographical Scope

3.10.13 Site observations, a manual desk-based review of OS maps, characterisation studies and relevant heritage receptors were used to determine the study area. The study area is informed by building locations and heights, topography and townscape features, and an understanding of the scale of the proposed development.

Construction Methodology

3.10.14 The demolition and construction period is short to medium-term, defined within the context of the ES. The assessment will consider the short to medium-term impact of the construction phase on the appearance, function and quality of the surrounding receptors.

3.10.15 These effects are the necessary first steps in the regeneration of the site and will be removed following completion. The heritage assessment in particular, construction effects, being short to medium-term, are generally treated as less significant and long-term conservation is of paramount importance in making any judgement.

3.10.16 The continued function of the surrounding area during the phase is imperative to the vitality of the townscape. The proposed development may incorporate construction and management mitigation measures for avoiding and reducing environmental effects during the phase.

Operational Methodology

3.10.17 The operational period is long-term, defined within the scope of the ES. The proposed development may incorporate primary mitigation measures that become embedded into the project design. Mitigation measures, where required, are employed to prevent/avoid significant adverse effects, through careful planning, siting, access, layout and scale of buildings.

3.10.18 GPA3: Setting states:

“as screening can only mitigate negative impacts, rather than removing impacts or providing enhancement, it out never to be regarded as a substitute for well-designed developments within the setting of heritage assets”.

3.10.19 The assessment will consider residual effects (i.e. those which remain after mitigation). Where appropriate, we identify specific design measures that mitigate impact within the discussion of residual effects.

3.10.20 Where appropriate, the proposed development may be subject to an overarching design code or condition of the planning permission. The Design Codes set out guidelines within which future proposals can be brought forward, and are intended to provide BoB with controls to inform the basis of future reserved matters applications relating to, *inter alia*, appearance and landscaping.

Assessment Criteria

Heritage

3.10.21 The term ‘heritage receptor’ is used within this assessment to describe a designated (e.g. World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area) or non-designated (identified by the Local Authority e.g. building of townscape merit) heritage asset. For the purposes of this THVIA, built heritage receptors do not include archaeological remains.

3.10.22 Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment (2015) set out a framework of four inter-related key values for assessing the significance of historic buildings and places. The significance of a heritage asset is the sum of its archaeological, architectural, historic and artistic interest.

“Significance derives not only from a heritage asset’s physical presence, but also from its setting”. (NPPF, 2012)

3.10.23 To aid simple communication and avoid confusion with the term “significance” as used in a conventional EIA sense, heritage significance will be referred to as ‘Heritage Value’.

3.10.24 Value is assessed against the criteria contained in Table 2, below. The assessment of heritage value is graded “exceptional” to “very low”. It is commonly agreed that Grade I and II* buildings are of “exceptional” and “particularly important” interest; therefore these are generally afforded a higher heritage value. The differentiation is best

summarised by the drafting of paragraph 128 of the NPPF, which states the:

“level of detail (to describe the significance of heritage assets) should be proportionate to the assets’ importance.

3.10.25 Thus, a grading is appropriate. Non-designated heritage receptors and recognised as having local value. Due and proportionate regards has been given to all heritage receptors identified.

Table 2: Heritage Receptor Value Criteria

Heritage Receptor Value		
Value	Criteria	Examples
Exceptional	Building/site/area of international significance	Likely to be World Heritage Sites, Areas of Natural Beauty and National Parks. Often listed Buildings Grade I and II* and their settings, Scheduled Monuments with upstanding remains, registered Historic Parks and Gardens Grade I and II* and their settings.
High	Building/site/area of national significance	May be Listed Buildings Grade I and II* and their settings, Scheduled Monuments with upstanding remains, registered Historic Parks and Gardens Grade I and II* and their settings.
Medium	Building/site/area of national significance	Often Listed Buildings Grade II and their settings, Conservation Areas and their settings, Scheduled Monuments without upstanding remains, and registered Historic Parks and Gardens Grade II and their settings.
Low	Building/site/area of national and/or regional significance, or local asset of particular significance	May be Listed Buildings Grade II and their settings, Conservation Areas and their settings, Scheduled Monuments without upstanding remains, registered Historic Parks and Gardens Grade II and their settings, and

		buildings of local interest.
Very Low	Building/site/area/ with some evidence of significance but in an incoherent or eroded form or local interest and generally with no statutory protection	Often buildings of local interest and dispersed elements of townscape merit. Assets may be so badly damaged that too little remains to justify inclusion into a higher grade.

3.10.26 Where a proposal may affect the surroundings in which the receptor is experienced, a qualitative assessment is made of whether, how and to what degree setting contributes to the significance of heritage assets. This is informed by the check-list of potential attributes of a setting, as outlined by Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (2015).

3.10.27 GPA3: Setting identifies five steps towards assessing the implications of development proposals which may affect the setting of heritage receptors (it is consistent with other guidance):

- Identify the assets affected;
- Assessing the contribution setting makes to significance;
- Assessing the effect of the proposed development;
- Maximising enhancement and minimising harm; and
- Making and documenting the decision and monitoring outcomes.

3.10.28 Setting is defined in the NPPF as “*the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral*”.

Townscape

3.10.29 The framework for assessment of townscape and visual receptors is to be prepared using the Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013) (‘GLVIA3’). We have also had regard to the methodology set out in An Approach to Landscape Character Assessment (2014) prepared by Natural England.

3.10.30 Townscape is the “*built-up area, including the buildings, the relationships between them, the different types of urban open spaces, including green spaces, and the relationship between buildings and open spaces*”, as defined in GLVIA3.

- 3.10.31 An initial assessment defined distinct and recognisable patterns of elements, or characteristics that make one area different from another, rather than better or worse. This process, defined as townscape character assessment, is the process of identifying and describing variation in the character of townscape.
- 3.10.32 The assessment was informed by both field survey and desk based research of secondary sources, with reference to existing character assessments where applicable. The assessment allowed the description of character areas/types, their key characteristics and for them to be mapped with boundaries. The mapped boundaries suggest a sharp change from one townscape area. On site, however, this often represents a zone of transition. Townscape character areas are identified and assessed according to townscape receptor value (in relation to their built form, materials, maintenance, and statutory and non-statutory designations), using criteria contained in Table 3 below.

Table 3: Townscape Receptor Value Criteria

Townscape Receptor Value		
Value	Criteria	Examples/Features
Exceptional	Very attractive, unique or outstanding townscape with clearly distinctive characteristics, features and elements; Widespread use of quality materials; Very strong urban structure, characteristic patterns and balanced combination of built form and open space; Good condition - appropriate management for land use; Unique sense of place; No detracting features.	Internationally or Nationally recognised World Heritage Site, Archaeological Important Area, Scheduled Ancient Monuments, sites of national importance recorded on the Sites and Monument Record (SMR) or National Monuments Record (NMR) and Grade I and II* Listed Buildings.
High	Very attractive townscape with distinctive or unusual features and elements; Evident use of quality materials; Strong urban structure, characteristic patterns and balanced combination of built form and open space;	Nationally, Regionally or District recognised Archaeological Important Areas, Scheduled Ancient Monuments, Grade II Listed Buildings, Grade II Listed Parks and Gardens, Tree Preservation Orders and sites of national, regional or county importance recorded on the SMR or NMR.

	<p>Appropriate management for land use with limited scope to improve;</p> <p>Strong sense of place;</p> <p>Occasional detracting features.</p>	
Medium	<p>Attractive townscape with some distinctive features;</p> <p>Recognisable urban structure, characteristic patterns and combinations of built form and open space;</p> <p>Scope to improve management for land use;</p> <p>Some features worthy of conservation;</p> <p>Sense of place;</p> <p>Some detracting features.</p>	<p>Regional, District or Local recognised</p> <p>Generally undesignated but value expressed through literature and cultural associations or through local plan designations, conservation areas and demonstrable use. May contain Listed Buildings. Tree Preservation Orders and sites of county or local importance.</p>
Low	<p>Typical, commonplace and unremarkable townscape with limited variety or distinctiveness;</p> <p>Distinguishable and urban structure, characteristic patterns and combinations of built form and open space;</p> <p>Scope to improve management for land use;</p> <p>Some features worthy of conservation;</p> <p>Some dominant detracting features.</p>	<p>District or Locally recognised</p> <p>Certain individual townscape elements or features may be worthy of conservation and townscape either identified for or would benefit from regeneration, restoration or enhancement. Site or area may be valued at a community level.</p>
Very Low	<p>Townscape often in decline;</p> <p>Weak or degraded urban structure, characteristic patterns and combination of</p>	<p>Not formally recognised</p>

	<p>built form and open space; Lack of management has resulted in degradation; Frequent dominant</p>	
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3.10.33 The objective of identifying the existing context is to provide an understanding of the townscape in the area that may be affected – its constituent elements, its character and the way this varies spatially, its geographic extent, its history, its condition, the way the townscape is experienced and the value attached to it.

Visual

3.10.34 The framework for assessment of visual receptors has been prepared using the Guidelines for Landscape and Visual Impact Assessment, Third Edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013) (GLVIA3).

3.10.35 The aim of the visual baseline is to establish the area in which the development may be visible, the different groups of people who may experience views of the development, the places where they will be affected and the nature of the views and visual amenity at those points.

3.10.36 The baseline study identifies individuals and/or defined groups of people within the area who will be affected by changes in the views, 'visual receptors'. The following visual receptors are identified by GLVIA3 as being likely to be the most susceptible to change:

- Residents at home;
- People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focused on the landscape and on particular views;
- Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
- Communities where views contribute to the landscape setting enjoyed by residents in the area.

3.10.37 Assessment viewpoints were identified based on a comprehensive review of the surrounding area, including the following criteria:

- Heritage receptors; and/or
- Townscape character; and/or
- Where the development may be prominent; and/or

- Be visible from concentrations of residential areas; and/or
- Open spaces (parkland, publicly accessible space); and/or
- Potentially sensitive receptors (e.g. schools); and/or
- Accessibility to the public; and/or
- The viewing direction, distance and elevation; and/or
- Townscape and transport nodes.

3.10.38 There will be areas within the study area where visibility is not possible e.g. due to interposing development. Conversely, the assessment considers further long distance views where identified and relevant. Mindful of the assessment objective to understand likely significant effects to heritage, townscape and visual receptors, we consider this a reasonable approach which is proportional to the scale and nature of the Proposed Development.

3.10.39 The visual assessment is supported by Accurate Visual Representations (AVRs), which provide the basis for the assessment of the Proposed Development and its effect on the agreed key views. It is important to note, however, that AVR's, even the most 'realistically' rendered, have limitations. They are 2-D representations from a fixed point of scenes which are perceived as one moves around.

3.10.40 Critically, they lack depth cues and are rendered in clear lighting conditions at times of greatest visibility (generally). Neither do they capture transient significant effects arising from noise or traffic on perception, or that wider range of expectations and associations that anyone in an urban scene may have.

3.10.41 The text accompanying each view seeks to contextualise it. Inevitably one must accept that judgement is involved in this specialist area on the basis of the above and the importance of design quality in the operation of policy. In preparing any written assessment, allowances are made for these factors as well as the assessor's knowledge of the scheme.

3.10.42 The views are identified and assessed according to visual receptor value, using the criteria contained in Table 4, below.

Table 4: Visual Receptor Value Criteria

Visual Receptor Value	
Value	Criteria/Examples
Exceptional	Identified strategic views, into and out of World Heritage Sites, and / or views of national and international importance.
High	Statutory development plan identified views and/or views of

	<p>national or regional importance, or particular local importance.</p> <p>May comprise public open spaces where focus is on views/public rights of way through highly valued townscape, regional routes, immediate setting of elements of national cultural heritage value that are not compromised.</p>
Medium	<p>Supplementary planning documents identified views including conservation area appraisals, and/or views of regional or local importance.</p> <p>May comprise public rights of way through townscapes of moderate value, setting for elements of local and/or regional cultural heritage value or national value whose settings are already compromised.</p>
Low	<p>Observer within area of ordinary townscape value, or good townscape value where significant elements detract.</p>
Very Low	<p>Observer within area of very low townscape quality (e.g. industrial areas/busy main roads) that has very few positive characteristics.</p>

Assessment of Sensitivity and Magnitude

- 3.10.43 Following the identification of baseline conditions, the effect of the Proposed Development on each of the identified receptors is then considered and a judgement formed as to the duration, extent and magnitude of effect.
- 3.10.44 Scoping and the baseline assessment may conclude that some effects on receptors are unlikely to be significant and therefore do not need to be considered further. Where applicable, these receptors are identified within the relevant assessment sections of the THVIA.
- 3.10.45 In order to identify the sensitivity of a receptor to the Proposed Development the baseline value must be calibrated by the susceptibility to change. Susceptibility is the ability of the receptor to accommodate proposals without undue consequences for the maintenance of the baseline situation and/or the achievement of planning policies and strategies. For heritage receptors, susceptibility also considers the setting of the receptor in conjunction with its value and the particular nature of the proposals.

3.10.46 This is an assessment bespoke to the project that considers the specific nature of the proposals in relation to the value of the receptor. It is a qualitative judgement recorded in a verbal scale (e.g. high, medium or low), although supported by a clear narrative linked to evidence from the baseline study.

Table 5: Susceptibility of Receptor to Change Criteria

Susceptibility to Change Criteria	
Low	The receptor has a high ability to accommodate the specific proposed change, and/or The receptor's existing setting may make a negative contribution to the heritage value of the asset, and/or Distance, topography and/or intervening may block any visual relationship with the proposed change.
Medium	The receptor has a medium ability to accommodate the specific proposed change, and/or The receptors' existing setting may make a neutral contribution to the significance of the asset, and/or Distance, topography and/or intervening development may block or allow a visual relationship with the proposed change.
High	The receptor has a low ability to accommodate the specific proposed change, and/or The receptor's existing setting makes a positive contribution to the heritage value of the asset, and/or Distance, topography and/or intervening development may allow a visual relationship with the proposed change.

3.10.47 Table 6 provides an indicative matrix to identify sensitivity, based on combining receptor value and susceptibility to change.

Table 6: Nature of Receptor Likely to be Affected (Sensitivity)

Nature of Receptor Likely to be Affected (Sensitivity)			
Receptor Value	Susceptibility of Receptor to Change		
	Low	Moderate	High
Very Low	Low	Low	Low / Moderate
Low	Low	Low / Moderate	Moderate
Medium	Low / Moderate	Moderate	Moderate / High
High	Moderate	Moderate / High	High
Exceptional	Moderate / High	High	High

3.10.48 A professional judgement is made of the magnitude of likely effect using criteria at Table 6. Magnitude of effect is determined by the size or scale, geographical extent or duration and reversibility of the effect. Magnitude considers whether the Proposed Development:

- Conforms with the pattern, scale, mass, grain and historic features of the receptor;
- Creates a loss or restoration of key features of the receptor;
- Contributes to the identified receptor character; and
- Accords with national, regional and local planning policy and guidelines.

Table 7: Nature of the Effect Likely to Occur (Magnitude)

Nature of the effect likely to occur to receptor (Magnitude)	
High	<p>Considerable change to the value of the receptor.</p> <p>The proposals are a new component, ranging from a notable change in receptor characteristics over an extensive area to intensive change over a more limited area.</p> <p>The proposals would be very noticeable.</p> <p>Loss of or major alteration to key elements / features / characteristics of the baseline. The duration of this effect may be permanent and non-reversible.</p>
Medium	<p>A clearly discernible change to the value of the receptor.</p> <p>The proposals are dissimilar to a main component of the receptor but similar to other components.</p> <p>The proposals would be readily noticeable.</p> <p>Partial loss of or alteration to one or more key elements / features / characteristics of the baseline. The duration of this effect may be semi-permanent and partially reversible.</p>
Low	<p>Slight change to the value of the receptor.</p> <p>The proposals are similar to a main component of the receptor but similar to other components.</p> <p>The proposals would not be readily noticeable.</p> <p>Minor loss of or alteration to one or more key elements / features / characteristics of the baseline. The duration of this effect may be temporary and reversible.</p>
Negligible	<p>Barely discernible change to the value of the receptor.</p> <p>Very minor loss of or alteration to one or more key elements / features / characteristics of the baseline.</p>
Neutral	<p>No change to the value of the receptor.</p>

Likely Significant Effects

3.10.49 Likely significant effects are determined through combining judgements of sensitivity and magnitude, using a common matrix shared across all topic areas (Table 8).

Table 8: Likely Significant Effect on Receptor Matrix

Likely Significant Effect on Receptor			
Magnitude	Sensitivity		
	Low	Moderate	High
Neutral	None	None	None
Negligible	Negligible / Neutral	Negligible / Neutral	Negligible / Neutral
Low	Minor	Minor / Moderate	Moderate
Medium	Minor / Moderate	Moderate	Moderate / Major
High	Moderate	Moderate / Major	Major

Table 9: Likely Significant Effect

Likely Significant Effects	
Major Beneficial	The scheme would be in keeping with and would provide a major improvement to or reinforce the value of the receptor
Moderate Beneficial	The scheme would be in keeping with and would provide a noticeable improvement to or reinforce the value of the receptor
Minor Beneficial	The scheme would be in keeping with and would provide a slight improvement to or reinforce the value of the receptor
Negligible	The scheme would have no effect on the value of the receptor or would be barely perceptible / in keeping with and would maintain the value of the receptor
Minor Adverse	The scheme would have a minor negative effect to the value of the receptor
Moderate Adverse	The scheme would cause a noticeable deterioration in the value of the receptor
Major Adverse	The scheme would cause a major deterioration in the value of the receptor

3.10.50 Combining respective sensitivity and magnitude matrices provides an indication of the likely significant effects. Professional judgement is, however, also required to determine significant likely effects. Qualitative assessment text is used to describe and elucidate this judgement to the reader. This is necessary because THVIA is not a

strict quantitative process and some of these considerations will depend on expert judgements. Accordingly there is an emphasis on narrative text throughout the report to describe the receptors and the judgements in regard to the significance of the identified effects.

- 3.10.51 Justification for the direction of effects (beneficial, adverse or neutral/negligible) is discussed within the qualitative assessment text.
- 3.10.52 Within the judgement of likely significant effects there is a distinction between levels of significance and direction of effect, expressed as a 'word-scale'. The word-scale set out in table 8 is consistent for all topic areas (heritage, townscape and visual).
- 3.10.53 Ratings of significance are independent of 'acceptability' of the scheme as a whole, which is a judgement above and beyond that of significance. Acceptability is about the overall balance of benefits and harm from the proposals as viewed or weighted by national policy and development plan policies.
- 3.10.54 It is generally considered that moderate to major effects are considered 'significant' in the context of the EIA Regulations.
- 3.10.55 The report also considers the direct, indirect and secondary, cumulative, short-, medium- and long-term, permanent and temporary effects of the Proposed Development.
- 3.10.56 Broadly, short to medium-term effects are considered to be those associated with the demolition and construction phase and long-term effects are those associated with the completed and occupied Proposed Development.
- 3.10.57 'Local', 'district' or 'national' scale is relative to the spatial scale of the effects.
- 3.10.58 Direct effects may cause a physical change (e.g. alteration, extension or demolition) to the receptor as a consequence of construction or operation.
- 3.10.59 Indirect effects arise from the effect of activities that do not explicitly form part of the scheme. They may occur as a consequence of construction or operation of the development scheme, but may have an effect some distance from the development. Assessment of impacts on heritage setting refers to perceptible visual and aural (noise) effects that can be appreciated at a given time.
- 3.10.60 Secondary impacts are a consequence of construction or operation of the development, and can result in physical loss or changes to a receptor beyond the development footprint. For example, construction of related infrastructure such as roads or powerlines that are required to support the development. Facilitated impacts should also be

considered which may be further actions (including by third parties) which are made possible or facilitated by the development.

3.11 Transport

3.11.1 The Transport chapter of the ES will consider the key transport, traffic and access impacts associated with the proposed development. The assessment will be undertaken by Markides Associates. A standalone Transport Assessment (TA) Scoping Report has been prepared and submitted to BoB and Hertfordshire County Council for comment.

Scope and Issues

Baseline Environment

3.11.2 As a brownfield development the ES chapter and TA will set out details of the existing land uses located within the site boundary, which currently include:

- c.16,000sqm GFA of B1 office including New Tesco House, Heldrew House and part of Old Tesco House.
- c.65,000sqm GFA of B1/B2/B8 uses including the Tesco Resource Centre and Old Tesco House;
- c.6,000sqm GFA of other commercial uses; and
- 1,150 car parking spaces, utilised by the Tesco site.

3.11.3 The existing conditions with respect to the Local Highway Network, walking, cycling and public transport facilities will also be reviewed in detail with analysis from the traffic surveys.

3.11.4 Assessment of collision data for the previous 5-year period will be obtained and analysed for the length of Delamare Road, Windmill Lane, Turner's Hill, High Street and Cadmore Lane.

3.11.5 Given the nature of the proposed development, the pedestrian and cycle network near the site will also be assessed in relation to providing safe and convenient access to local facilities, transport interchanges and services.

3.11.6 Cheshunt Railway Station is located 200m from the southern end of Delamare Road and 800m from its northern end. Crossrail 2 is proposed to operate from Cheshunt and the station will benefit from new services direct into central London as well as increased frequencies to existing destinations. The benefits of this scheme will be outlined.

3.11.7 The bus services that operate in the vicinity will also be reviewed with respect to the closest stops to the site, bus frequency and destinations. The nearest bus routes to the site are at the 'Old Pond' which is 650m

from the southern end of Delamare Road and on the High Street and 800m from the northern end.

Assessment Methodology

Construction

3.11.8 The impacts of the proposed development will be considered for both the construction and operational phases. Dependent on the potential construction phasing strategy and rate of occupation, it may also be necessary to consider the impact of construction on parts of the site that are operational.

3.11.9 The impacts will also be considered with and without any new infrastructure as delivery timescales for this are uncertain at present.

3.11.10 Impacts during operation will be influenced by the car parking strategy for the site and ability of occupants to access a vehicle as a mode of travel.

3.11.11 In terms of potential road traffic impact, it should be highlighted that the Institute of Environmental Assessment, state in their document, 'Guidelines for the Environmental Assessment of Road Traffic, published in 1993, suggest two broad rules which will inform the scope of the assessment, which are:

- Include road links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%); and
- Include any specifically sensitive areas where traffic flows would increase by 10% or more.

3.11.12 Potential transport impacts during construction include:

- A potential increase the number of vehicles during the day, including HGV's, on the local road network when compared with the Baseline Do Minimum Scenario when the existing site was operational.
- Sections of the site being constructed when other parts are occupied. This impact in terms of number of movements will be assessed.
- An increase in person trips using non-car modes of travel to access the site, when compared to the Baseline Do Minimum Scenario when the site was operational.

3.11.13 It is not anticipated that the number of construction vehicles during any specific hour will result in a significant increase above "Baseline, Do Minimum Scenario" levels to necessitate any junction capacity assessments.

Operation

3.11.14 The introduction of the proposed development may result in the following:

- A change in vehicle trip generation to/from the site, influenced by the adopted car parking provision. Where it is demonstrated that the impact is either not significant or indeed a reduction, off-site junction capacity analysis will not be undertaken.
- A change in the number of non-vehicle trips generated by the site. This impact will be assessed.
- A change in the pedestrian and cycling environment, which may impact upon amenity, safety and severance.
- A change in the highway network due to new or altered existing links. These will be modelled and the impact assessed in relation to the proposed altered highway layout and impact on the existing network.

Assessment Criteria

3.11.15 The following list details the receptors on which potentially significant effects could occur because of the magnitude of the impact and/or the sensitivity of the identified receptor.

- Adjacent residents;
- Adjacent commercial occupants;
- Delamare Road highway network and baseline vehicle and cycle movements;
- Cadmore Lane highway network and baseline vehicle and cycle movements;
- Windmill Lane highway network and baseline vehicle and cycle movements;
- Cadmore Lane footway network;
- Windmill Lane footway network;
- Delamare Road footway network;
- Cheshunt railway station; and
- Lee Valley.

3.12 Water Resources, Flood Risk and Drainage

Scope and Issues

Baseline Environment

3.12.1 The water resources, flood risk and drainage assessment will focus on effects associated with the run-off from the site and any physical effects on surface water quality. The assessment will also examine the proposed surface water drainage system and consider the increase in

demand for wastewater treatment and drinking water supply. This assessment will be undertaken by Rogers Cory Partnership.

3.12.2 Initial searches into the Environment Agency's (EA) website has identified the development site to be located mainly within flood zones 2 and 3, considered to be at medium and high risk of flooding from rivers respectively, In this respect requirements in the NPPF (foot note 20) states the following:

“site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding.”

3.12.3 The EA flood maps indicate the presence of the Windmill Lane Ditch which runs along the western boundary of site and crosses through the southern parts of the site through a series of culverts under the railway into the Small Lea. The College Brook runs along the southern side of Windmill Lane and passes under the rail tracks and continues in the Small Lea. Any works within 8m of these Main Rivers and culverts will be subject to a Flood Defence Consent from the EA.

3.12.4 Groundwater mapping published by the EA indicates that the site is located over a Groundwater Vulnerability Zone designated as a Minor Aquifer High. The site is not located over a Groundwater source protection zone but is over a designated Secondary A Superficial Deposit Aquifer.

3.12.5 According to existing British Geological Survey (BGS) maps the site is located over the London Clay Formation with an Alluvium superficial deposits. Detailed ground investigations, including groundwater monitoring and infiltration testing to BRE365 will be carried out to support the site specific flood risk assessment and drainage strategy proposals.

3.12.6 Key issues which will be investigated are as follows:

- Effects of fluvial flooding both on the proposed development and impacts offsite;
- Effects of surface water run-off quality during construction and operational stages of the development;
- Potential impacts on the hydrology and flood risk of the adjacent watercourses as part of the development; and
- Effects of increased potable water and wastewater demand and any associated upgrade works required.

Assessment Methodology

3.12.7 For the purpose of assessing the hydrology and flood risk as part of our proposal for the site, a detailed site specific flood risk will be undertaken in accordance with NPPF and associated Planning Practice Guidance has included a review of the Environment Agency Flood Zones and Strategic Flood Risk Assessment (SFRA).

3.12.8 The Hydrology and Flood Risk work will be split into two separate phases of work, these are:

- Flood Risk Assessment; and
- Environmental Statement.

3.12.9 The FRA and ES will be undertaken in accordance with the policies and advice obtained from the Environment Agency, the Water Regulators, the Broxbourne SFRA and the Local Planning Authority.

3.12.10 The potential effects on the water environment will be determined by combing the sensitivity of the identified receptors with the predicted magnitude of change.

3.12.11 Thames Water will be consulted on the existing water supply and wastewater drainage capacity to determine whether any upgrade works will be required to serve the proposed development.

3.13 Wind Microclimate

3.13.1 The Wind Microclimate chapter of the ES will assess the likely significant effects of the proposed development on the environment with respect to the pedestrian safety and comfort levels, in the context of its proposed usage. The wind microclimate study will derive the probability of the local wind speeds exceeding comfort and safety threshold levels set out by the industry standard Lawson Criteria for pedestrian safety and comfort. The assessment will be undertaken by BMT Fluid Mechanics.

Scope and Issues

Existing (Baseline) Conditions

3.13.2 The assessment will provide a qualitative review of the wind environment at key pedestrian level locations around the existing site in terms of suitability for pedestrian activities, based on industry standard pedestrian comfort and safety criteria.

Assessment Methodology

- 3.13.3 The study area will cover the site and the surrounding area to an extent deemed to cover the limit of potential impact of the proposed development. In order to gauge the likely effects of the proposed development on the local wind environment, a desk based assessment will be conducted by BMT Fluid Mechanics Ltd.
- 3.13.4 The study will provide a qualitative assessment of the local wind characteristics, in order to allow and evaluation of firstly, the wind conditions in and around the proposed development in relation to planned pedestrian activities and secondly, the potential impact of the proposed development on the wind environment of the surrounding area.
- 3.13.5 The assessment will include a review of the proposed scheme massing and the anticipated resulting wind flow patterns, combined with a consideration of appropriate meteorological data transposed to apply directly to the site. The study will draw on BMT's considerable experience in the assessment of wind flows formed from detailed studies of similarly massed schemes within the urban and suburban environment. These detailed studies have been based on the Lawson Criteria for pedestrian comfort and safety (detailed below).

Lawson Comfort Criteria

- 3.13.6 Details of the comfort criteria are presented in Table 9 below, and are based on the exceedance threshold wind speeds based on the mean hourly value and on the gust equivalent mean value occurring less than 5% of the time. The value of 5% has been established as giving a reasonable allowance for extreme and relatively infrequent winds that are tolerable within each category.

Table 9: Lawson Comfort Criteria as Described for Various Activities

Threshold Speed	Wind	Comfortable Activity	Qualifying Comments
4m/s		'Long term sitting'	Reading a newspaper, eating and drinking.
6m/s		'Standing or short term sitting'	Appropriate for bus stops, window shopping and building entrances.
8m/s		'Walking and strolling'	Suitable for general areas of walking and sightseeing.
10m/s		'business walking'	Appropriate for local areas around tall buildings where people are not likely to linger.

Lawson Safety Criteria

3.13.7 Details of the safety criteria are presented below in Table 10, and are also based on the exceedance threshold wind speeds (the mean hourly value and the gust equivalent mean value, occurring once per annum, equating to a seasonal threshold exceedance of approximately 0.04%). A wind speed greater than 15 metres per second (m/s) occurring once a year is classified as being unsuitable for the general public and represents a wind speed with the potential to destabilise the less able members of the public such as the elderly, cyclists and children. Able-bodied users are those determined to experience distress when the wind speed exceeds 20m/s.

Table 10: Lawson Seasonal or Annual Distress Criteria

Threshold Speed (m/s)	Wind	Activity	Qualifying Comments
15m/s		'General public access'	Less abled individuals and cyclists find conditions physically difficult.
20m/s		'Able bodied access'	Able-bodied persons find conditions difficult. Physically impossible to remain standing during gusts.

3.13.8 The assessment will consider seasonal variations in both wind conditions and pedestrian activities.

Significance Criteria

3.13.9 The significance of the impact of the proposed development will be based on the suitability of wind conditions in each area against the current or planned pedestrian activities. In summary, the following criteria will be used to assess likely wind conditions as a result of the proposed development:

- **Major Beneficial** – Any impact on wind conditions which potentially significantly improves pedestrian safety.
- **Moderate Beneficial** – Any impact on wind conditions which improves pedestrian comfort from unsuitable to suitable for current or planned activities.
- **Minor Beneficial** – Any impact on wind conditions which marginally improves pedestrian comfort from unsuitable to marginal/tolerable for current or planned activities, or from marginal/tolerable to suitable for current or planned activities.
- **Negligible** – Any impact that does not alter the suitability of existing wind conditions with respect to current or planned activities.

- **Minor Adverse** – Any impact on wind conditions which marginally worsens pedestrian comfort from suitable to marginal/tolerable for current or planned activities, or from marginal/tolerable to unsuitable for current or planned activities.
- **Moderate Adverse** – Any impact on wind conditions which worsens pedestrian comfort from suitable to unsuitable for current or planned activities.
- **Major Adverse** – Any impact potentially affecting pedestrian safety.

Sensitive Receptors

3.13.10 The following receptors have been identified with regard to wind microclimate:

- Residents and users of the proposed development; and
- Existing residents adjacent to the application site.

Construction Effects

3.13.11 Construction effects are not considered with respect to the pedestrian level wind environment, which is assessed in the context of planned pedestrian activities in and around the completed development.

Operational Effects

3.13.12 The assessment will provide a qualitative review of the wind environment at key pedestrian level locations around the proposed development in terms of suitability for pedestrian activities related to industry standard pedestrian comfort and safety criteria. The study will further assess the expected impact of the proposed development relative to the existing site conditions in terms of the suitability, with respect to the wind microclimate, for planned and current usage.

3.13.13 Key pedestrian level locations to be investigated will include:

- Pedestrian access routes in and around the site.
- Entrances to the buildings of the existing site and proposed development.
- Recreational and open areas within the site.

Mitigation

3.13.14 Any required mitigation measures will be identified and, where deemed appropriate, their effectiveness in providing suitable wind conditions for planned pedestrian activities will be verified via boundary layer wind studies to be conducted at an appropriate stage in the design process.

Summary and Residual Effects

3.13.15 Where appropriate, relevant mitigation measures will be developed and validated through boundary layer wind studies. Any residual impacts will be identified and assessed.

3.14 Summary Chapters and Structure of Environmental Statement

13.14.1 The proposed content of the Cumulative Impacts chapter is outlined in Section 3.1 above.

13.14.2 Each technical chapter of the ES is proposed to outline the likely residual effects of the proposed development. The Summary and Conclusions chapter of the document will provide a summary of these effects (with the anticipated implementation of proposed mitigation measures), as discussed in the various technical chapters of the ES.

13.14.3 Within each of the technical chapters of the ES, the information will be presented in a uniform structure to the extent feasible (given the variation in topics). The proposed structure can be described generally as follows:

- Introduction
- Statutory and Planning Policy Context
- Assessment Methodology
- Baseline Environment
- Impacts
- Mitigation
- Residual Effects
- Cumulative Effects
- Conclusions
- Appendices (as appropriate, to be provided in Volume 4)

13.14.4 The ES will contain a number of technical appendices, where appropriate, within Volume 4 which will support the various technical chapters of the document.

13.14.5 For further information regarding the proposed structure of the ES, please refer to Section 5.0 of this report below.

4.0 NON-SIGNIFICANT ENVIRONMENTAL ISSUES

4.0.1 The Project Team have reviewed the potential environmental effects of the proposed development and the consideration of likely significant effects. Upon detailed consideration, it is the opinion of the Project Team that the following issues noted in this section of the report can be scoped out of the EIA and will not be included as individual technical chapters within the ES. Justification for the exclusion of the individual issues can be found in the sections below.

4.1 Archaeology

4.1.1 A Desk-Based Archaeological Assessment has been carried out by CgMs Consulting at the proposed development site. This report has concluded the site is considered to have low archaeological potential for all periods. Based on the low archaeological potential and previous severe and widespread below ground impacts, it is considered unlikely the proposed development will impact upon below ground archaeological deposits, should they be present. Given the low archaeological potential of the site, no additional archaeological work is merited at this stage in this particular instant.

4.1.2 In consideration of the above, archaeology is considered to be a non-significant environmental issue on a standalone basis for the site and the proposed development. It is proposed that Archaeology is scoped out of the ES and a separate technical chapter will not be prepared.

4.2 Energy and Sustainability

4.2.1 The proposed development's impact on energy and sustainability will be addressed within each of the relevant technical chapters of the ES, with climate change adaptation and mitigation measures outlined as appropriate for the various environmental issues.

4.2.2 At the time of the submission of the outline planning application, a Sustainable Development Statement will be submitted to BoB. This report will cover the social, economic and environmental aspirations of the scheme and will be central to the masterplan and to each discipline contributing to the successful delivery of the proposed new neighbourhood.

4.2.3 Where relevant, the individual technical chapters of the ES will cross refer to these supporting documents.

4.2.4 In consideration of the above, energy and sustainability are considered to be non-significant environmental issues on a standalone basis for the

site and proposed development. It is proposed that Energy and Sustainability is scoped out of the ES and a separate technical chapter will not be prepared.

4.3 Telecommunications and Electronic Interference

- 4.3.1 In consideration of the location of the site and the proposed maximum height within the proposed development, it is unlikely that the proposed development will cause significant telecommunications and electronic signal interference.
- 4.3.2 Analogue television broadcast has now been phased out and replaced by digital television, which is largely unaffected by atmospheric conditions that previously affected analogue television, and does not suffer reflection effects and ghosted image generation. Given the switch to digital television broadcast, the proposed development will be unlikely to give rise to significant effects on digital television. The proposed development is not anticipated to interfere with terrestrial TV or satellite TV signals from transmitters.
- 4.3.3 BoB requested in the pre-application response that Telecommunications and Electronic Interference is considered within the Environmental Statement. This topic will therefore be considered within Chapter 04, Proposed Development. We will engage with the mobile operators to ensure the development will not impact upon on services.

4.4 Waste

- 4.4.1 Discussion regarding expected construction waste streams can be provided as part of the Construction Management chapter of the ES. It is anticipated that prior to the commencement of the demolition and construction works, a CEMP will be prepared in line with best practice measures and will outline the management of demolition and construction waste and recycling on site.
- 4.4.2 It is anticipated that a Site Waste Management Plan (SWMP), sometimes referred to as a Resource Management plan (RMP) with best practice targets for the diversion of waste from landfill will be prepared for the proposed development. The SWMP will address hazardous and non-hazardous waste through both the demolition and construction phase of the proposed development, and will contain stringent targets and procedures for the diversion of waste from landfill.
- 4.4.3 With respect to the operation of the proposed development, discussion regarding the anticipated operational waste streams and the management of this waste will also be included in the Design and

Access Statement (regarding design considerations) and in the Sustainable Development Statement (regarding environmental assessment requirements and criteria).

- 4.4.4 In consideration of the above, waste is considered to be a non-significant environmental issue on a standalone basis to the site and the proposed development. It is proposed that Waste is scoped out of the ES and a separate technical chapter will not be prepared.

4.5 Summary of Non-Significant Environmental Issues

- 4.5.1 It has been determined by the Project Team that there are no anticipated significant environmental issues within the topic areas noted above, and separate technical chapters of the ES are therefore not deemed to be required. If deemed required by BoB through further pre-application consultation, assessments for these topic areas can be submitted through standalone reporting for the purposes of the planning application.

5.0 PROPOSED ENVIRONMENTAL STATEMENT STRUCTURE

- 5.1 The structure of the ES is proposed to comprise the following set of documents, to be confirmed throughout the preparation of the EIA. Please note that the proposed general structure of the technical chapters has been outlined in paragraph 3.15.3 above. The subsections of the individual technical chapters are to be determined in consultation with the Project Team and through the scoping process.

Volume 1

Non-Technical Summary

Volume 2 Main Report

01 Introduction
02 EIA Methodology
03 Alternatives Considered
04 Proposed Development
05 Demolition and Construction Management
06 Air Quality
07 Daylight and Sunlight
08 Ecology
09 Ground Conditions and Contamination
10 Noise
11 Socio-Economics
12 Transport
13 Water Resources, Flood Risk and Drainage
14 Wind Microclimate
15 Cumulative Impacts
16 Summary and Conclusions

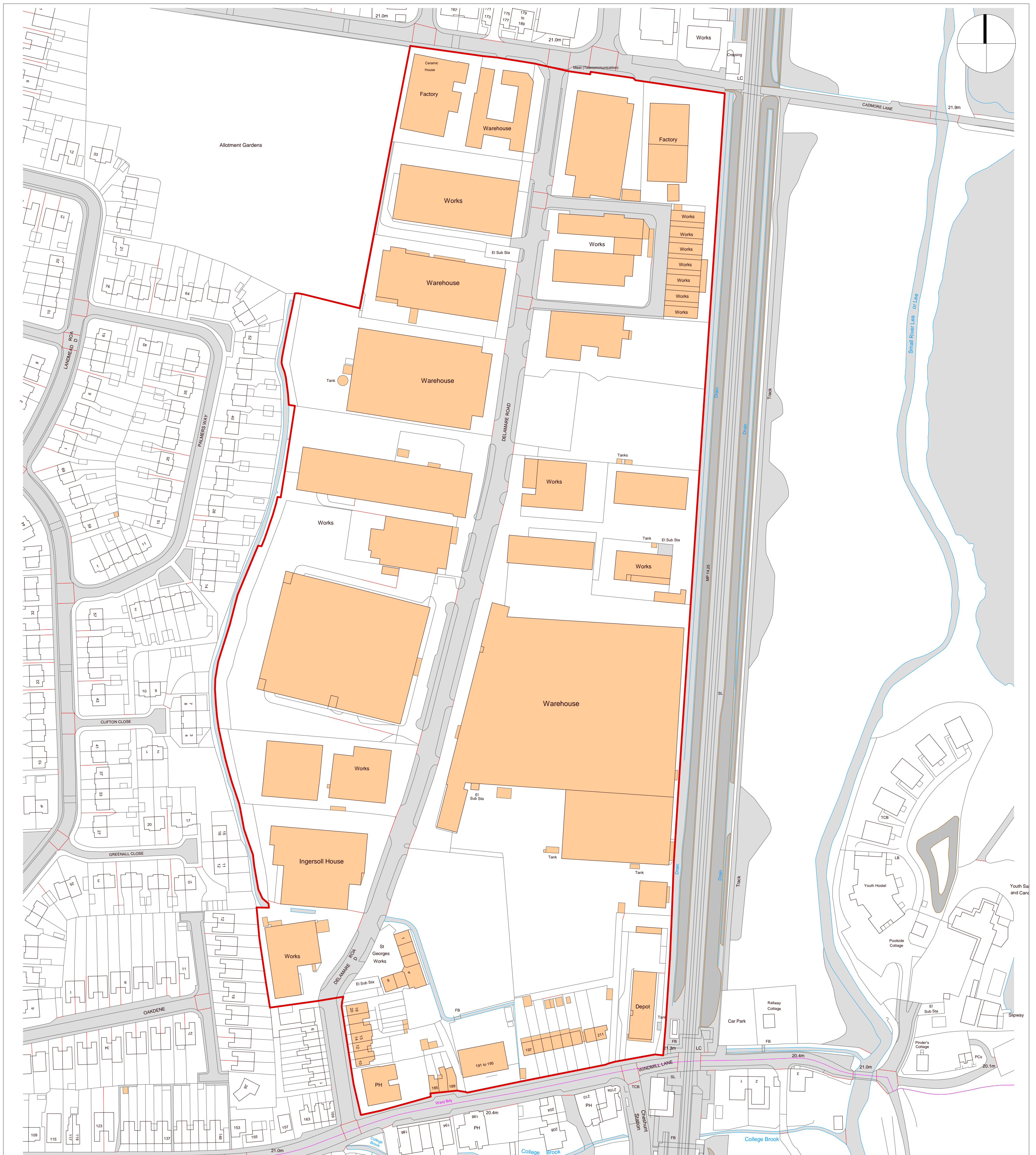
Volume 3

Townscape, Heritage and Visual Impact Assessment

Volume 4

Appendices

APPENDIX A: SITE LOCATION PLAN



metropolis planning & design
pd as green

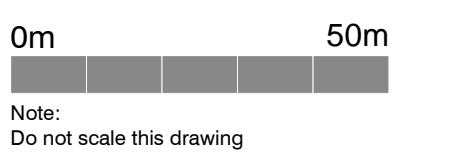
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 Scale: 1:2000 @ A3

Revisions:

00 04 November 2016

3043-D1000-rev00

Date: 04 November 2016



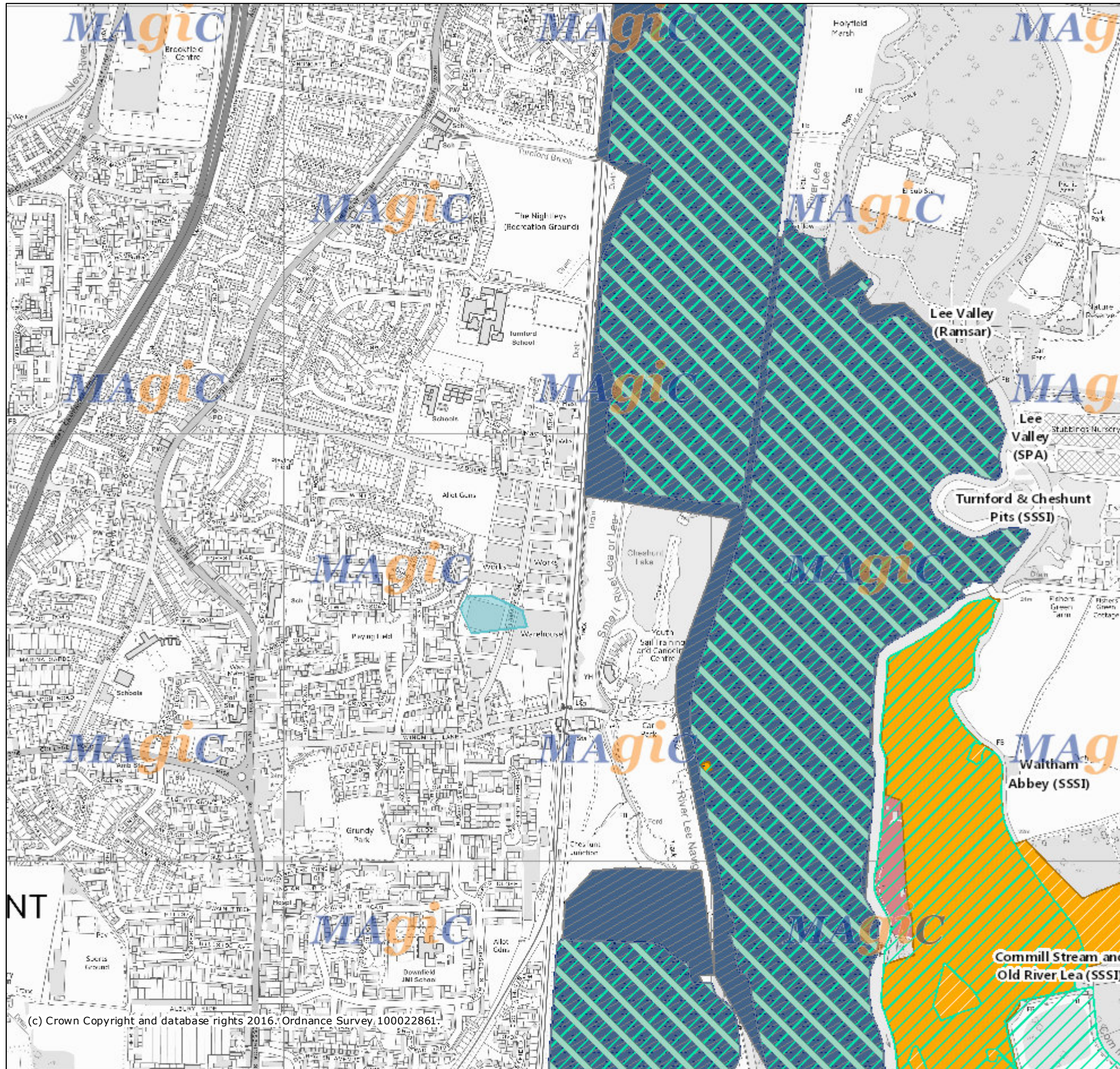
Note:
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Cheshunt
 Lakeside,
 Delamare Road,
 Cheshunt

for
 Inland
 (Stonegate)Ltd

Application
 Boundary

APPENDIX B: ECOLOGICAL DESIGNATIONS



Legend

- Local Nature Reserves (England)
- National Nature Reserves (England)
- National Parks (England)
- Ramsar Sites (England)
- Sites of Special Scientific Interest (England)
- Special Protection Areas (England)
- Scheduled Monuments (England)
- World Heritage Sites (England)**
- Buffer Zone
- World Heritage Site
- Registered Battlefields (England)
- RSPB Reserves (GB)
- Priority Habitat Inventory - Lowland Fens (England)
- Priority Habitat Inventory - Lowland Raised Bog (England)
- Priority Habitat Inventory - Reedbeds (England)
- Priority Habitat Inventory - Upland Flushes, Fens and Swamps (England)
- Ancient Woodland (England)**
- Ancient and Semi-Natural Woodland
- Ancient Replanted Woodland
- Important Bird Areas (GB)

Projection = OSGB36
 xmin = 535000
 ymin = 201500
 xmax = 538300
 ymax = 204000

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