



QA**Ruabon Park - Sustainability Statement**

Issue/Revision:	Second Draft	Final
Date:	December 2013	December 2013
Prepared by:	Ruth Geeson	Ruth Geeson
Signature:		
Authorised by:	Iain Fraser	Iain Fraser
Signature:		
File Reference:	550481rg18Dec13F02_Sustainability	550481rg19Dec13F03_Sustainability

EXECUTIVE SUMMARY

The application site is located at Ruabon Park in Wrexham within the administrative boundary of the Wrexham County Borough (Wrexham BC), Wales.

The outline application is for mixed-use a development comprising commercial (Class A1 foodstore with petrol filling station and associated car parking, Class A4, Class B1, Class B8 and Class C1), Class C2 extra-care, Class C3 residential including land reserved for a Primary School (Class D1), with primary access off the A539 and B5605 and other associated improvements. The application will be made with all matters reserved except means of access.

By undertaking a sustainability appraisal at the very earliest stage in the design process, the potential to contribute positively to sustainable development is optimised.

The sustainability statement shows that the proposals are meeting a number of key policy objectives and conforming to current good practice in sustainable development:

- Design development will be informed by the principles of sustainable development and benchmarked against contemporary best practice including Code for Sustainable Homes¹, and BREEAM²;
- Various aspects of the development have been considered in order to maximise as far as possible the energy efficiency of both the commercial and residential elements of the development, including ensuring they are well insulated and airtight to minimise heat loss;
- Consideration of a range of low and zero carbon technologies, including the possible specification of a ground source and air source heat pumps;
- Glazing and roof lighting designed to optimise natural daylight in the buildings, reducing energy consumption and reliance on artificial lighting
- A sustainable travel plan including provisions for bicycle and improved pedestrian links and access to excellent quality public and private amenity space

- Early consideration to holistic site-wide water reduction strategies, including mechanical water recovery systems, which would reduce both potable water demand and pressure on existing waste water infrastructure.
- The development will also incorporate key sustainability best practice features in areas such as water efficiency, pollution, sustainable waste management, and ecology;
- The proposed development will incorporate the use of Sustainable Drainage Systems (SuDS) by including areas of soft landscaping, which will help minimise run-off resulting from the proposed development;
- The proposed development will include the use of sustainable construction methods and the buildings will be constructed using products and materials from sustainable sources as far as possible;
- The landscape proposals for the application site provide enhancement in terms of the ecological value through landscaped amenity spaces and, and have the potential for features such as green walling;
- The proposed development will provide an optimum use of the site and is in accordance with local and regional aims for redevelopment within the Wrexham BC, by providing a range of housing units, and commercial opportunities that would positively contribute towards a number of identified planning needs in the area and are aligned also with market need and demand.



CONTENTS

1.0 INTRODUCTION	1
2.0 THE PROPOSED DEVELOPMENT	3
3.0 SUSTAINABLE DEVELOPMENT	4
WHAT IS IT?	4
KEY SUSTAINABILITY DRIVERS	6
NATIONAL PLANNING POLICY	7
Planning Policy Wales	7
LOCAL PLANNING POLICIES	8
Wrexham Unitary Development Plan (UDP)	8
4.0 INTEGRATING SUSTAINABILITY INTO THE PROPOSED DEVELOPMENT	12
BUILDING SPECIFIC DRIVERS	12
Code for Sustainable Homes	12
BREEAM	15
KEY SUSTAINABILITY ISSUES	21
ENERGY	22

MATERIALS	25
WATER	28
WASTE AND SITE MANAGEMENT	31
TRANSPORT	35
POLLUTION	37
ECOLOGY AND BIODIVERSITY	39
WELLBEING	41
5.0 SUMMARY & CONCLUSIONS	43
6.0 GLOSSARY & ABBREVIATIONS	44
7.0 REFERENCES	47

1.0 INTRODUCTION

- 1.1 Greengage was commissioned by Wynnstay Farming Company Limited ('the applicant') to prepare a Sustainability Statement for a mixed-use residential-led development at Ruabon Park in Wrexham within the Wrexham County Borough (Wrexham BC). The site currently benefits from an extant planning permission for a business park.
- 1.2 This report presents the outcome of the sustainability appraisal of the proposed development and details the approach that the applicant has collectively taken towards achieving a high standard of sustainable development and environmental performance. This Statement outlines the features that have been incorporated into the design proposals and the measures that will be implemented during the construction and operation phases, which aim to reduce the environmental impact of the scheme and contribute positively to sustainable development.
- 1.3 The purpose of the Sustainability Statement is to provide an independent verification that the design of the proposed development is in accordance with sustainable objectives of relevant planning policy at all levels and is an example of good practice in sustainable design. This Statement reports the performance of the proposed development using local, regional and national level guidance on sustainability indicators from both government and industry.
- 1.4 The Statement includes:
- A brief description of the proposed development;
 - A description of the client's sustainability credentials;
 - A definition of sustainable development;
 - A summary of the relevant international, national, regional and local sustainable development policy drivers;
 - An examination of the performance of the scheme in accordance with key sustainable policies at all levels, including the Policy Plan Wales⁵ and the adopted *Wrexham UDP*⁶.
 - A review of the proposed development's sustainability against set planning objectives and good practice identifying opportunities and constraints of both the application site and the proposals.

-
- 1.5 By undertaking the sustainability appraisal at this stage in the design process, the potential to contribute positively to sustainable development is optimised. The Sustainability Statement, therefore, also provides a framework for the team to monitor the scheme's performance throughout its development.

2.0 THE PROPOSED DEVELOPMENT

- 2.1 The application site is a parcel of land approximately 24.9 hectares in size located to the south-west of the village of Ruabon near Wrexham at central OS grid reference SJ 297 432. The A539 forms part of the northern boundary of the site, a caravan park set within an area of parkland is located to the east, arable farmland is located to the south and broad-leaved woodland and a small industrial park are located to the north and north-west respectively.
- 2.2 The proposed development comprises a mixed-use a development comprising commercial and residential uses (detailed below) and also includes land reserved for a Primary School (Class D1). The primary access will be off the A539 and B5605. The application will be made with all matters reserved except means of access.
- 2.3 The proposed uses are as follows:
- Class A1 foodstore with petrol filling station 1,858m² (GFA) associated car parking;
 - Commercial B1 (Office) 12,960m² (GFA);
 - Class B8 (warehousing) and/or Class C2 (extra-care) 4,646m² (GFA);
 - Class A4 (pub) and/or Class C1 (Hotel) 2,787m² (GFA); and
 - Class C3 residential, 300 units. The residential element assumed for indicative purposes to take the form of 14 x 2-bed, 169 x 3-bed and 90 x 4-bed dwellings. 10% (30 dwellings) would be affordable housing.

3.0 SUSTAINABLE DEVELOPMENT

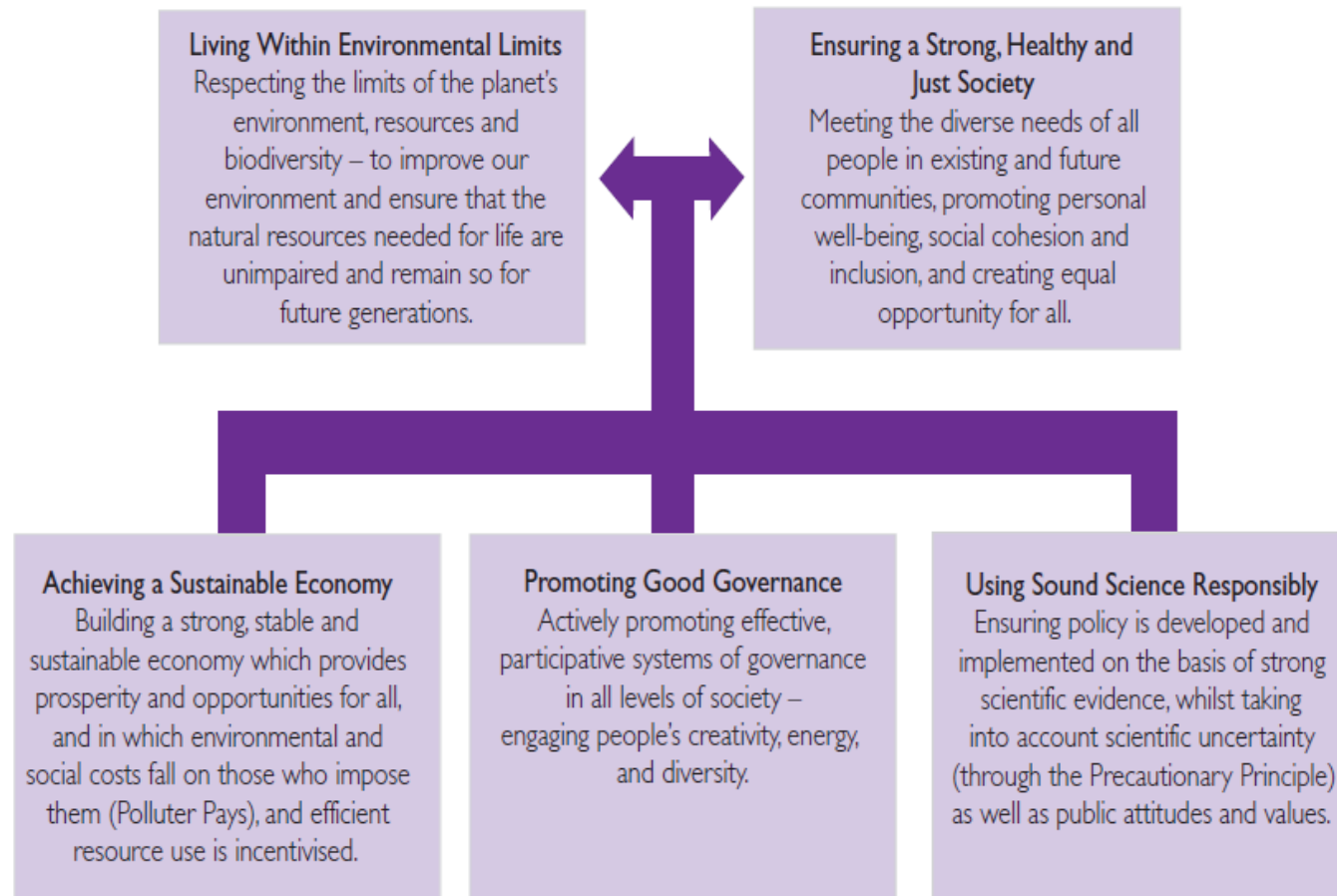
WHAT IS IT?

- 3.1 The past 20 years have seen a growing realisation that the current model of development is unsustainable. In other words, we are living beyond our means. From the loss of biodiversity due to the felling of rainforests or over-fishing, to the negative effect our consumption patterns are having on the environment and the climate, our way of life is placing an increasing burden on the planet.
- 3.2 The goal of sustainable development, therefore, is to seek to simultaneously progress economic, social and environmental goals and policies in ways that develop and maintain a good quality of life for us all and enable future generations to do the same.
- 3.3 In the UK, the UK Government and Devolved Administrations have clearly set out what sustainable development means for them and the approach they will take to pursue their goal. They offer the following interpretation:

'Sustainable development is about positive growth-making economic, environmental and social progress for this and future generations'.

- 3.4 To provide a clearer picture of what they mean in practice, such definitions are often underpinned by key principles that serve to guide policy-making and decisions. The UK Government has outlined a shared set of guiding principles for sustainable development in the UK Framework for Sustainable Development, 'One future - different paths' - they are the 'Five Principles of Sustainable Development' (see Figure 3.1 below).



Figure 3.1 Five Principles of Sustainable Development

KEY SUSTAINABILITY DRIVERS

- 3.5 Strategies for sustainable development – broad, long-term plans of action aimed at achieving the goals of sustainable development – have been developed by national governments and a range of organisations throughout the world in order to set out a blueprint for action on sustainable development.
- 3.6 In 1994, the UK became the first country to publish such a strategy: *Sustainable Development, the UK Strategy*³. A revised strategy – *A Better Quality of Life*⁴ – was published in 1999.
- 3.7 Strategies for sustainable development are not only used at the level of national government. They also provide strategic visions of sustainable development for:
- International organisations;
 - Business;
 - Individual government departments;
 - Regions; and
 - Local government.
- 3.8 The following sections describe key regional and local planning policy that seeks to drive sustainable development and that will be of most relevance to the proposed development for Ruabon Park.



NATIONAL PLANNING POLICY

Planning Policy Wales

- 3.9 Planning Policy Wales⁵ (PPW) was adopted in November 2012 and confirmed that sustainable development will be the central organising principle of the Welsh Government. The Welsh Ministers are promoting sustainable development:
- a. by placing sustainability at the heart of decision making;
 - b. by working with others, such as local government, business, Welsh Government Sponsored Bodies (WGSBs), Executive Agencies and the voluntary sectors;
 - c. by encouraging and enabling others to embrace sustainable development as their central organising principle;
 - d. by monitoring our progress towards sustainability;
 - e. through specific policy actions; and
 - f. through strategic policies (such as PPW).



The Welsh Government has set out to achieve annual carbon reduction-equivalent emissions reductions of 3 per cent per year from 2011 in areas of devolved competence, and to achieve at least a 40% reduction in all greenhouse gas emissions by 2020 against a 1990 baseline.

- 3.10 Policy GDP1 - Secure the development of sustainable communities, through the promotion of the economic, social and environmental well-being of the area.
- 3.11 To move towards more sustainable and zero carbon buildings in Wales, the Welsh Government expects that the following standards will be met:
- 3.12 Applications for 5 or more dwellings received on or after 1st September 2009 to meet CSH Level 3 and obtain 6 credits under issue Ene1 – Dwelling Emission Rate
- 3.13 Applications received on or after 1st September 2009 for non-residential development which will either have floorspace of 1,000 m² or more,

or will be carried out on a site having an area of one hectare or more, to meet BREEAM 'Very Good' standard and achieve the mandatory credits for 'Excellent' under Ene1 – Reduction of CO₂ Emissions.

LOCAL PLANNING POLICIES

Wrexham Unitary Development Plan (UDP)

- 3.14 In parallel with the need to provide for future built development, the strategy seeks to safeguard the County Borough's natural environment and particularly those landscapes, individual sites and habitats which have been identified as having specific visual or ecological importance.
- 3.15 Applicable Strategic Policies include:
- *'Policy PS1 New development for housing, employment, and community services will be directed to within defined settlement limits/employment areas.*
 - *Policy PS2 Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment.*
 - *Policy PS3 Development should use previously developed brownfield land comprising vacant, derelict or underused land in preference to the use of greenfield land, wherever possible, particularly so where greenfield land is of ecological, landscape or amenity value, or comprises agricultural land of grades 1, 2 or 3a quality.*
 - *Policy PS10 Priority in waste management will be given to minimising the volume of waste generated, followed by maximising the re-use and recycling as much waste as possible. Energy recovery from waste will be favoured where re-use and recycling is not feasible, and waste will be managed at, or as near as practicable, to the location where it is initially produced.*
 - *Policy PS11 Encouragement will be given to proposals which improve the biodiversity value of sites and to the establishment of local nature reserves where the nature conservation and landscape interest of the land will be protected and enhanced.*

- *Policy PS12 Proposals for the generation of energy from renewable sources will be supported provided that the wider environmental benefits are not outweighed by any detrimental impacts of the proposed development (including any electricity transmission facilities needed) on the landscape, public safety, and the local environment.'*
 - *'Development on green field sites usually results in an increase in the amount of impermeable land. This can alter the natural water cycle as rates and volumes of surface water reaching a surface watercourse generally increase. Drains and sewers generally convey surface water from impermeable areas directly, or via a sewerage system, to a watercourse. Such arrangements not only reduce the natural recharge of groundwater, which wastes a valuable resource and increases pollution risk (for example from contaminated urban run-off and combined sewage overflows) but can also increase river flows. Increased river flows can cause physical damage to the banks and bed of a watercourse, and increase the risk of flooding'⁶*
- 3.16 Policy EC12 Development (including the raising of land) within defined flood plains will only be permitted if it:-
- *'would not be subject to an unacceptable risk of flooding on-site; and/or*
 - *does not result in an unacceptable risk of flooding on or off-site; and/or*
 - *does not adversely affect flood management or maintenance scheme'*
- 3.17 Wherever practicable surface water should be disposed of as close to the source as possible. Where potential risks are identified appropriate flow attenuation facilities or mitigation measures may be a pre-requisite for development. Consideration should be given to the use of softer engineering structures referred to as Sustainable Urban Drainage Systems (SUDS), which are physical structures built to receive surface water runoff.

4.0 INTEGRATING SUSTAINABILITY INTO THE PROPOSED DEVELOPMENT

- 4.1 With respect to sustainable development at Ruabon Park, a number of key policy objectives have been identified at national, regional and local level. This Sustainability Statement will therefore assess the performance of the proposed development against these key sustainability policies, including those from the PPW and the Wrexham's adopted UDP.
- 4.2 In addition, however, there are a number of other industry drivers that promote the delivery of sustainable built environments, and these will also be considered for the proposed development in order to ensure that a holistic approach is taken towards design development, which considers all aspects of environmental and sustainability performance.
- 4.3 There are also other sustainability standards that the proposed development will be looking to address during design development, and these are considered below.



BUILDING SPECIFIC DRIVERS

Code for Sustainable Homes

- 4.4 The *Code for Sustainable Homes*⁷ (CSH) was introduced by the UK Government in April 2007 as a single national standard intended to facilitate a step change in the environmental performance of new housing.
- 4.5 The CSH aims to encourage and reward best practice through the recognition of improvements made to the design of residential buildings. It evaluates buildings against a number of environmental criteria captured under nine key environmental categories, including:
- **Energy** – rewards energy efficiency and renewable energy generation;
 - **Water** – promotes water efficiency and water recycling;
 - **Materials** – rewards the responsible sourcing of materials;



- **Surface water run-off** – encourages a reduction in surface water run-off from sites and management of flood risk;
- **Waste** – promotes best practice with regards to waste management including greater recycling of waste during construction, and the provision of facilities to enable household recycling throughout occupation;
- **Pollution** – promotes measures to reduce air and water pollution;
- **Health and wellbeing** – promotes a healthy and comfortable internal environment;
- **Management** – rewards good construction site practices, provision of information to building occupants to encourage environmental awareness and addresses home security; and
- **Ecology** – encourages ecological protection and enhancement.

4.6 The CSH has six rating levels, which are awarded on the basis of achieving both a set of mandatory minimum standards and a minimum overall score as set out in Table 4.1 below.

Table 4.1 Code for Sustainable Homes Level ratings

CSH Level		Total Points Score Required (equal to or greater than)
LEVEL 1	Equivalent to the Energy Saving Trust's (EST) Good Practice Standard for energy efficiency.	36
LEVEL 2		48
LEVEL 3	Equivalent to the EST's Best Practice Standard for energy efficiency.	57
LEVEL 4	Approximately equivalent to the PassivHaus/EST's Advanced Standard for energy efficiency.	68
LEVEL 5		84
LEVEL 6	Aspirational standard based on zero carbon emissions and high performance across all environmental categories.	90

CSH Performance

- 4.7 A high level CSH Preliminary Assessment (pre-assessment) review has been carried out on the proposed development at Ruabon Park. During the pre-assessment, the opportunities and constraints of the application site and design proposals were identified. The applicant and the design team will undertake a more detailed CSH pre-assessment as the design is being developed, ensuring the incorporation of suitable environmental and sustainability features in order to optimise the CSH Level and confirm that the targeted rating can be achieved.
- 4.8 Planning Policy Wales section 4.12.4 confirms that for residential units a Code for Sustainable Homes (CSH) assessment must be undertaken and that all dwellings must meet CSH level 3 and 6 credits under Ene 1 – Dwelling Emission Rate.
- 4.9 The applicant is committed to achieving a the required CSH Level 3 rating, 3 and 6 credits under Ene 1 – Dwelling Emission Rate which exceeds the minimum policy requirements set by Wrexham BC.

- 4.10 By committing to the achievement of these CSH ratings, the applicant is ensuring that they have maximised the opportunities to enhance the environmental performance of the design and ultimately that the best practice sustainability standards demanded by the CSH will be implemented in practical terms within the proposed development.

BREEAM

- 4.11 The Building Research Establishment's Environmental Assessment Method (BREEAM) is a nationally recognised means of reviewing and improving the environmental performance of buildings. BREEAM 2011 New Construction (NC) is a performance based assessment method and certification scheme for new buildings. Since July 1st 2011, BREEAM NC has been used to assess all newly registered developments and major refurbishments (where a greater than 50% change is occurring to both the building fabric and building services).
- 4.12 BREEAM NC has been designed to cater to all common building types (offices, retail, industrial etc.) however; the scope has also been expanded to cater for a number of other buildings types that under the older versions of BREEAM required BREEAM Bespoke criteria.
- 4.13 Used as a design tool, BREEAM will assess the environmental performance of new build buildings and refurbishments, providing a framework for improvement and an auditable demonstration of good design practice.
- 4.14 BREEAM considers key global and local environmental issues and the internal environment for building occupants under eight categories, ranging from:
- Management - rewards good construction site practices, provision of information to building occupants and security;
 - Health and wellbeing - promotes a healthy internal environment;
 - Energy - rewards energy efficiency and renewable energy generation;
 - Transport - encourages locations with good access to public transport;
 - Water - promoting water efficiency and water recycling;
 - Materials & Waste - rewards the responsible sourcing of materials and recycling;

- Land use and ecology - encourages ecological enhancement; and
- Pollution - promotes measures to reduce air and water pollution.

- 4.15 A certified assessment is third party verified by the Building Research Establishment (BRE) ensuring comparable benchmarking and high standards of assessment across the UK. Carried out by trained assessors, BREEAM provides an easily understood independent, transparent label of environmental performance.
- 4.16 At the certified assessment stage, the design and specification is assessed against the BREEAM criteria and credits are awarded where it can be demonstrated by an auditable trail of supporting evidence that the credit requirements have been met. The overall environmental performance across the categories is calculated as a percentage score and expressed as a single rating on a scale of 'Pass', 'Good', 'Very Good', 'Excellent' or 'Outstanding'.

Table 4.2 BREEAM Level Ratings

BREEAM Level	Percentage Score Required (equal to or greater than)
PASS	≥30 - <45
GOOD	≥45 - <55
VERY GOOD	≥55 - <70
EXCELLENT	≥70 - <85
OUTSTANDING	<85

CSH and BREEAM Performance

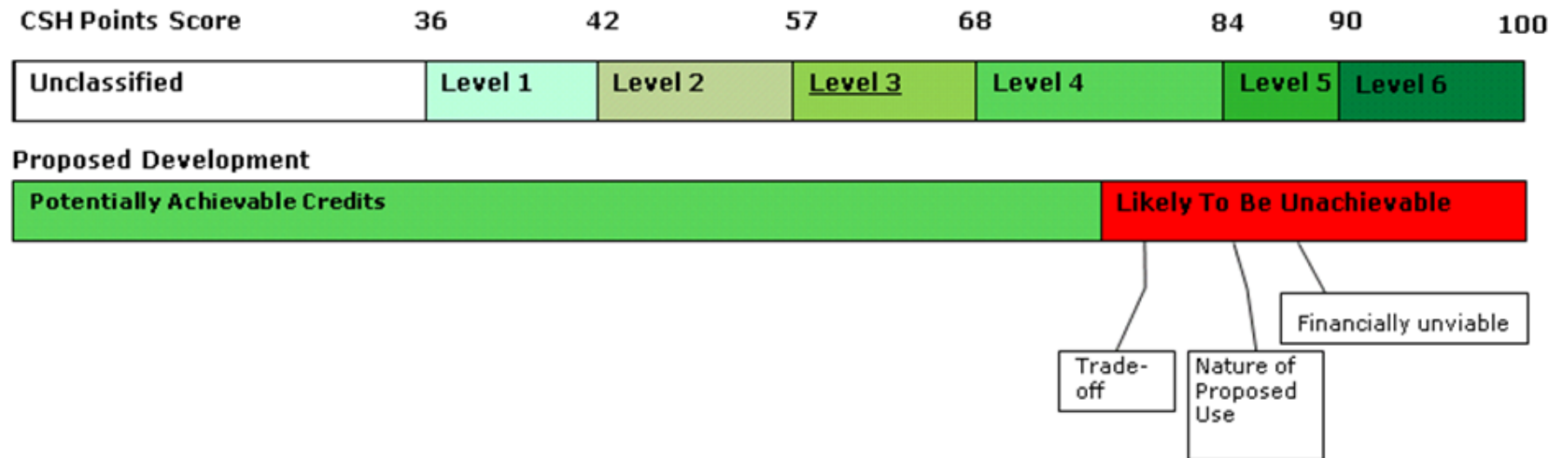
- 4.17 Planning Policy Wales (PPW) section 4.12.4 confirms that a BREEAM assessment is required for all non-residential buildings in excess of 1000m² or sites in excess of one hectare. A BREEAM 'Very Good' rating and a mandatory credit of 'Excellent' under Ene1 – Reduction of CO₂ emissions (i.e. 6no. Ene1 credits), must be achieved by all commercial buildings.
- 4.18 PPW section 4.12.4 also states that all residential dwellings are required to undertake a CSH assessment and achieve a Level 3 rating with a score of 57%; additionally achieving 6no. credits under the Ene1 – Reduction of CO₂ Emissions section. It should be noted that to achieve 6no. credits under Ene 1 for CSH Nov 2010 a 59% improvement on 2010 Building Regulations Part L1A must be achieved.
- 4.19 Pursuant to this, a high-level BREEAM and CSH pre-assessment review has been undertaken by Greengage Environmental LLP. The aim of this pre-assessment was to identify the opportunities and constraints of the application site and the proposed uses, and to maximise the opportunities for enhanced environmental performance once the designs are progressed at reserved matted stage.
- 4.20 The pre-assessment review of BREEAM credits demonstrates that all dwellings have the potential to achieve a CSH Level 3 scoring equal to or greater than 57 credits, archiving the mandatory Level 3 requirements, and 6 credits under Ene 1 – Dwelling Emission Rate. The pre-assessment review also confirms that all of the proposed commercial buildings have the potential to achieve BREEAM 'Very Good' rating (with a score of 55% or greater), and the mandatory 'Excellent' rating requirement under Ene1 – Reduction of CO₂ emissions (i.e. 6no. Ene1 credits).
- 4.21 It is not possible to state with certainty which credits will be targeted by the design team; however the sustainability measures which should be considered for the proposed development are discussed in the preceding section Key Sustainability Issues along with the BREEAM/CSH requirements.
- 4.22 Figures 1 and 2 below demonstrate a suggested scoring range for BREEAM and CSH assessments at the proposed development. Figures 1 and 2 also show the likely number of unachievable credits, and the suggested restrictions upon achieving a higher BREEAM score.

Figure 1: Suggested scoring range for BREEAM Assessments



- 4.23 The applicant is committed to undertaking a BREEAM New Construction (NC)⁸ assessment and achieve a BREEAM 'Very Good' rating with a score of 55%; additionally one of the mandatory requirements for 'Excellent' (achieving 6no. credits under the Ene1 – Reduction of CO₂ Emissions section) will also be achieved. Figures 1 demonstrates that there are no barriers to achieving this target.

Figure 2: Suggested scoring range for CSH Assessments



- 4.24 The applicant is also committed to undertaking CSH assessments for all domestic units and achieving a CSH Level 3 rating with a score of 57% and 6no. credits under the Ene1 – Reduction of CO₂ Emissions section. Figures 1 demonstrates that there are no barriers to achieving this target.
- 4.25 By committing to the achievement of these CSH and BREEAM ratings and requirements the opportunities to enhance the environmental performance of the designs is maximized so that the best practice sustainability standards demanded by the BREEAM methodology will be implemented in practical terms within the proposed development.
- 4.26 BREEAM and CSH Pre-Assessment reports will be undertaken as the design is developed in order to demonstrate clear CSH and BREEAM pathways to the desired ratings.

- 4.27 Please see the Energy report for further discussion regarding how the proposed development could reach the required 6no. credits under Ene1 – Reduction of CO2 emissions and the suggested renewable energy strategies for the proposed development.

The Building/Home User Guides

- 4.28 Under the BREEAM and CSH assessments of the proposed development, future tenants and tenants of both the commercial and residential spaces will be supplied with a non-technical Building User Guide (commercial) or Home User Guide (residents), which will be designed to give information to the occupiers on the efficient operation and intended environmental performance of their occupied spaces. This is identified as being a particularly important tool for the commercial element, where tenants at this stage are currently unknown and unconfirmed to enable this space to be operated for its intended purpose in a sustainable manner.
- 4.29 Consequently, the Building/Home User Guides represent an important tool by which the team, who design and deliver a sustainable development on the ground, can ensure the development is used in such a way as to maintain optimum environmental performance not only in design but also during long-term operation.
- 4.30 The following environmental and sustainability appraisal will therefore include, where relevant, information to demonstrate how the operation of the building can be influenced via the Building/Home User Guides to bring about lasting environmental and sustainability performance for the proposed development.

Green Building Guide for Tenant Fit outs (Commercial)

- 4.31 In order to achieve the maximum value of the fit-out related credits within the BREEAM assessment, but without comprising the marketability of the commercial element of the proposed development. Consideration will be given to the compilation of a Green Building Guide, which demonstrates part compliance with BREEAM credits by producing a building specific Green Building Guide that is distributed to future tenant/s. This is a formal, but non-legally binding document, which provides development specific guidance to the tenant on carrying out their fit out in a manner that upholds the BREEAM criteria of the credit sought. The publication of a Green Building Guide is considered to be beneficial in promoting positive behavioural change amongst building occupants and users, to ensure the sustainable use of the proposed development at the long-term operational phase.

KEY SUSTAINABILITY ISSUES

ENERGY



TRANSPORT



WATER



POLLUTION



MATERIALS



WELLBEING



ECOLOGY &
BIODIVERSITY



WASTE & SITE MANAGEMENT



ENERGY

Sustainability Objective:

To address the causes of climate change by reducing emissions of greenhouse gases, in particular carbon dioxide (CO₂). To reduce the local and global impact of pollution on the environment, by improving the energy efficiency of properties and generating energy from low or zero carbon technologies.



Context

- 4.32 The energy that we use as part of our day-to-day functions and activities (including heat, electricity, light and kinetic energy) is generated primarily from two main sources: non-renewable (i.e. fossil fuels such as oil, gas and coal) and renewable (e.g. wind, solar, hydro, biofuel and ground). Unless generated from renewable sources, energy generation and consumption results not only in depletion of these non-renewable sources but also in the release of greenhouse gases such as carbon dioxide (CO₂), nitrogen oxide (NO_x), and airborne particulate matter from the combustion of these gases. These greenhouse gases contribute to climate change and other environmental effects that are considered to occur with increasing global temperature.
- 4.33 With increased pressure to meet growing energy demands and concerns over the impacts of greenhouse gases on climate change, governments around the world are putting in place commitments and targets to mitigate these impacts. In the UK, the Government has set targets of reducing overall CO₂ emissions by 80% by 2050 (compared with 1990 levels).
- 4.34 To help meet these targets, the focus is not only on expanding the use of renewable sources to generate energy, but also on energy conservation and, specifically on ensuring the energy efficiency of UK buildings is dramatically improved. This last focus is unsurprising considering that buildings account, directly and indirectly, for 44% of the UK's carbon emissions. The Government has long signalled its intention to move to zero carbon buildings, starting with homes in 2016 and finishing with all other buildings by 2019.
- 4.35 The use of renewable technologies through the introduction of the Energy Hierarchy is widely seen as the best practice approach to reducing CO₂ emissions using the three step method;

- Be Lean - reduce energy loads to a minimum through energy efficient heating and lighting systems, and efficient appliances;
- Be Clean - Cut transmission losses through local generation of energy (decentralised energy generation); and
- Be Green - Use combined heat and power and community heating, and meet the demand with clean fuels, such as renewable technologies.



- 4.36 The Welsh Government has set out to achieve annual carbon reduction-equivalent emissions reductions of 3 per cent per year from 2011 in areas of devolved competence, and to achieve at least a 40% reduction in all greenhouse gas emissions by 2020 against a 1990 baseline.
- 4.37 The Welsh Government's Energy Policy Statement (2010) identifies the sustainable renewable energy potential for a variety of different technologies including biomass electricity, PV, wind and hydro. They are subject to the requirements of the EU Renewable Energies Directive, which include the UK targets of 15% of energy from renewables by 2020.
- 4.38 The government promote the use of renewable and low carbon energy developments, such as those that:
- Are directly incorporated into the fabric of a building;
 - Built within a new development (e.g. development scale combined heat and power);
 - Are stand-alone directly connected to the grid;
 - Provide heat for a number of buildings (e.g. District heating); and
 - Provide cooling.

Delivery

- 4.39 A high level Energy Strategy has been produced for the proposed scheme, which has been developed by employing the 'Energy Hierarchy' method. A separate report has been submitted with this application describing the proposed energy performance targeted for the development of Ruabon Park. As a result of the adoption of the measures indicated within this report the operational carbon dioxide emissions from the development will be minimised, and thus indicates the likely features to be incorporated within the development to meet the energy targets, set by Planning Policy and Legislation.
- 4.40 During the design process various aspects of the development should be addressed in order to maximise as far as possible the energy efficiency across the built form, including:
- Maximising the natural daylight available to the employment units to limit the need for electric lighting and without causing overheating;
 - Ensuring the building is as well insulated and airtight as possible in order to minimise heat loss; and
 - Use of energy-efficient internal and external lighting with all external fittings controlled for the presence of daylight and motion-detecting sensors.
 - U values of:
 - Roof: 0.13 W/m²K;
 - Exposed walls and floors: 0.15 W/m²K;
 - External Doors: 0.55 W/m²K;
 - Windows and glazed doors: 1.4 W/m²K;
 - Solar reflective coatings with high light transmission factors to reduce solar heat gains while maintaining good daylight penetration;
 - 100% of all fixed internal lighting is dedicated low energy with suitable lighting controls;
 - Air permeability of 5m³/m².hr @ 50Pa or less;

- Use of Accredited Construction Details to reduce thermal bridging to 0.08 y value;
- Local control to each heating/cooling (where applicable) zone;
- Display energy metering
- Specification of energy efficient appliances; and
- Isolation and set back control of non-occupied areas.

4.41 In response to the second and third tier of the Energy Hierarchy, this study has considered a number of low carbon and renewable technologies. The target for the carbon dioxide savings has been led by the requirement to achieve 6no. credits under eh Ene1 sections of the CSH and BREEAM. As such the design team and client must consider all possible renewable and or ZLC technologies in order to achieve the necessary reductions in CO₂. A further more detailed report should be undertaken at the appropriate stage on the design.



MATERIALS

Sustainability Objective:

To reduce the global, social and environmental impact of the consumption of resources by using sustainably produced and local products.

Context

4.42 The embodied energy of a building material can be taken as the total primary energy consumed (the amount of carbon released over its life

cycle). Building materials have a vast environmental impact in terms of energy and resources in their production, use and disposal. Therefore, if environmentally responsive building materials are chosen, a significant amount of CO₂ can be saved during construction as well as during operation.

- 4.43 Consideration should also be given to materials' performance under potentially changing climatic conditions over the lifetime of the buildings by ensuring that the final selection facilitates the proposed development's ability to maintain comfortable temperatures - for example the use of a high thermal mass in the design of the buildings will help keep buildings cool during warm periods, and vice versa.

Delivery

- 4.44 Consideration has been given to the materials' performance under potentially changing climatic conditions over the lifetime of the building (for example the use of a high thermal mass in the design of the buildings will help keep buildings cool during warm periods and vice versa) ensuring that the final selection facilitates the buildings ability to maintain comfortable temperatures in line with the objectives of Sustainable Design that the applicant has aspired to.

- 4.45 Consequently, materials and products with the following characteristics will be used where possible to ensure sustainable construction:

- With a low embodied energy, namely natural materials such as timber and stone, and materials that require little processing including brick;
- That have a high recycled content including steel, glass and certain cladding and flooring products;
- That reuse materials including reclaimed materials;
- That are durable;
- That can be re-used, recycled, refilled, recharged or reconditioned;
- That can be easily upgraded by adding to/or replacing parts;
- That are light weight and so reduce the volume of materials within the building superstructure and require less fuel during transport;



- That are accredited to a recognised environmental standard, such as:
 - Forestry Stewardship Council (FSC), Canadian Standard's Association (CSA), Malaysian Timber Certification Council (MTCC), Programme for Endorsement of Forestry Certification (PEFC), Sustainable Forestry Initiative (SFI);
 - The Mobius Loop for products containing recycled materials; or
 - Materials whose extraction and processing is covered by a certified Environmental Management System where possible;
- That eliminate or minimise elements which are deemed to be hazardous to human health.

4.46 Under the pathway to achieving the highest BREEAM and CSH rating, materials choice has been informed by *The Green Guide to Materials Specification* (GGMS)⁹ which provides guidance regarding these materials with a low embodied energy and that are not deleterious to the environment during extraction or manufacturing. The GGMS will continue to be used during detailed design to ensure that where feasible, materials are selected with an A/A+ Green Guide rating, to maximise the number of credits that the team can achieve under the Materials category.

WATER

Sustainability Objective:

To conserve water by promoting water efficiency, water recycling and Sustainable Drainage Systems (SuDS).



Context

- 4.47 The average person in England uses 150 litres of water a day and research has shown that the average family's annual water consumption results in as much CO₂ as two transatlantic flights (1.54 tonnes of carbon each year). Yet water is becoming an increasingly scarce resource, with only 3% of the world's water being held as fresh water and less than 0.3% of this being available to humans. As more houses are built and the population increases, the pressures on the UK's water resources are growing. Climate change will only add to these pressures. To ensure a sustainable water supply for the future, it is therefore vital that water is used more efficiently and methods of harnessing and reusing water are developed and implemented. Pursuant to this, DEFRA's *Future Water*¹⁰ strategy sets out a number of objectives for more sustainable water use and management; of particular relevance is the target to 'reduce per capita consumption of water through cost effective measures, to an average of 130 litres per person per day by 2030'. This equates to a 20% decrease compared to the current average.
- 4.48 Furthermore, just as climate change seems likely to mean less water on average, it is also likely to mean more extreme weather events; therefore the issue of 'surface water' flooding is becoming more and more important. Many existing drainage systems can cause problems of flooding, pollution or damage to the environment and are not proving to be sustainable. Use of Sustainable Drainage Systems (SuDS) is a cost effective solution to harnessing and reusing water with a low environmental impact that can easily be incorporated into developments; SUDs drain away surface water run-off through collection, storage and cleaning before allowing it to be released slowly back into the environment.

Delivery

- 4.49 The proposed development will aim to develop a water strategy that reduces water demand through its design and specification and incorporates a drainage system with increased retention times and/or rainwater collection capacities. Consideration has been given to the efficient use of water in the construction phase and the team will require the contractor to monitor water consumption during the construction phase.
- 4.50 To reduce water consumption during the operation of the building, water efficient appliances will be incorporated within the proposed development to conserve water at its point of use, where specified.
- 4.51 In accordance with the mandatory requirements of the CSH level that has been committed to, it is expected that the end developer will ensure that each dwelling limits its water consumption to 105 litres per person, per day. Water efficient sanitary fittings will be specified in each dwelling to conserve water at its point of use. For example the following water efficiency measures could be expected for incorporation within a typical dwelling:
- 4/2.6 litre dual flush WCs;
 - Taps with low flow regulators (e.g. timed turn off, electronic, spray or aerated);
 - Showers with a nominal flow rate of 6 litres per minute (at 1.5 bar pressure);
 - Small size bath; and
 - Water efficient washing machines and dishwashers.
- 4.52 Details of the above water saving measures and how to use them correctly will be included in the Home User Guide, thus ensuring their efficient use throughout operation of the dwellings.
- 4.53 The team will also seek to liaise with incoming tenants for the commercial element to encourage the specification and incorporation of water efficiency measures as far as practicable, and will consider the following as part of the fit-out of the employment area. By encouraging future tenants to fit-out their development to minimise water consumption, the Green Building Guide and the Building User Guide will help promote



sustainable water management.

- 4.54 The proposed development is located in an area considered to be at low risk of flooding and as it is located in flood zone 1 taking into account the effect of flood defences in the area. Moreover, the proposed development will benefit from the incorporation of soft landscaping, which are considered to be a SuDS measure that will further reduce the rate of surface water runoff from the site.
- 4.55 The above water strategy will ensure that the proposed development complies with the following sustainability criteria:
- CSH and BREEAM – requirements met for water consumption and flood risk.

WASTE AND SITE MANAGEMENT

Sustainability Objective:

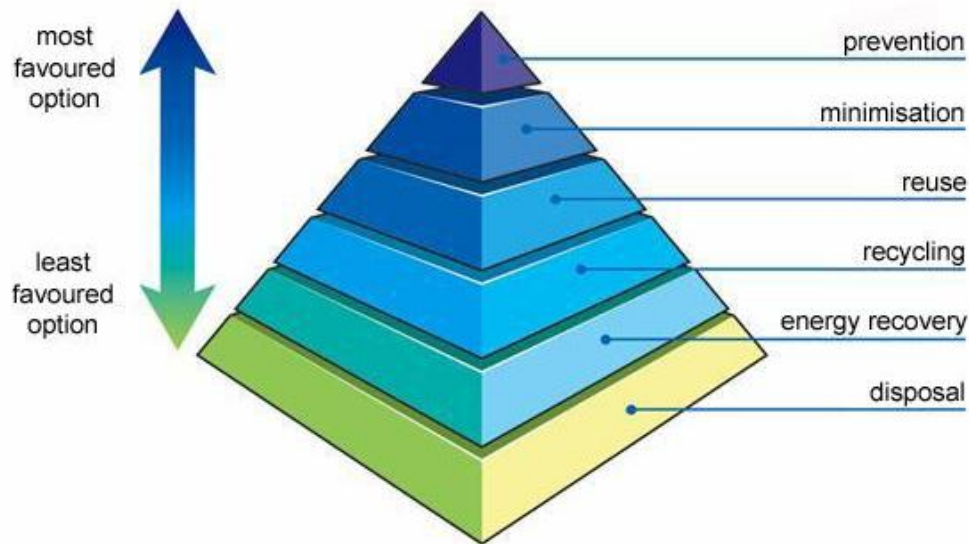
To reduce waste generation and disposal through the facilitation of recycling and to use sustainable methods of construction.

Context

- 4.56 All building activity is environmentally damaging. The key to sustainable design and construction is to minimise the impact the building has on the environment. Good construction site practices are essential to minimise potential impacts during this phase, such as noise and dust nuisances. Effective site waste management must also be implemented.
- 4.57 The UK faces major challenges to sustainable waste management - each year it is estimated that we generate about 100 million tonnes of waste from households, commerce and industry. About 30% of solid waste produced in the UK is construction waste, and 96% of all waste produced goes direct to landfill, creating risks of contamination from leaching of toxic materials and missing the opportunity to recover latent embodied energy and valuable materials for recycling.
- 4.58 The minimisation of waste and the increased use of recycled materials therefore form an intrinsic key to resource protection. The Waste Regulations 2011 includes the Waste Hierarchy, which is a framework for sustainable waste management setting out the preferential treatment of waste, as Figure 4.1 shows.



Figure 4.1 The Waste Hierarchy



Delivery

Waste Management- Construction Phase

4.59 The detailed design of the proposed development has considered measures to prevent and minimise waste while also delivering buildings that are cost effective to build, maintain and occupy. It is considered an objective to maximise the reuse of construction waste on the site and where reuse is unfeasible, to recycle waste with residual waste streams only being sent to landfill where no other option exists. Appropriate guidance has been sought in order to achieve this. It is recommended that the following are used to inform site waste management:

- The ICE Demolition Protocol¹¹;
- The Considerate Constructors Scheme; and

- British Standard 5906: 2005 Waste Management in Buildings - Code of Practice¹².
- 4.60 In line with these recommendations, the end developer(s) will be expected to prepare a Site Waste Management Plan (SWMP) that also includes the following commitments and procedures:
- Monitoring of waste generated on-site;
 - Sorting, reuse and recycling of construction waste, either on-site or through a licensed external contractor; and
 - Diversion of at least 85% of construction waste generated from landfill.
- 4.61 Where possible, 'designed out' waste through consideration of construction techniques, elements and component sizes that will prevent and minimise waste generation, and make the construction stage more time efficient and cost effective should be encouraged.

Waste Management-Operational Phase

- 4.62 Sustainable waste management will reduce the production of waste arising from the operation of the building to a minimum. In accordance with good practice guidance, the scheme will ensure that the building has appropriate space allocated for waste storage and containers to hold at least the minimum waste storage volume recommended by *British Standard BS: 5906*⁴⁷.
- 4.63 In order to ensure that residents of the proposed development maximise the opportunities provided for recycling, the applicant will strive to provide internal recycling bins within each dwelling for recyclable waste (separate to any bin provided for other non-recyclable waste), as well as composting facilities in line with the CSH requirements. Details of the recycling facilities available for residents and how they are operated will be provided to residents within the Home User Guide to ensure that sustainable waste management objectives are delivered during the operation of the proposed development.
- 4.64 In accordance with targeted BREEAM credits, the scheme will have appropriate and dedicated storage space to cater for recyclable materials generated by the operation of the commercial element of the proposed development. In addition, the recyclable space has been located on to allow for good vehicular access to facilitate collections. In addition, within the Building User Guide, awareness will be raised amongst users of the site of the need to minimise waste generation and encourage reuse, and recycling.

-
- 4.65 As such, the provision of both internal and external storage space for recyclable waste is considered to encourage minimisation of waste, in accordance with the principles of the Waste Hierarchy and the BREEAM and CSH requirements.

TRANSPORT

Sustainability Objective:

To reduce road congestion and pollution levels by enabling walking, cycling and use of public transport, and reducing the need for travel by private car.

Context

- 4.66 Transport currently accounts for a quarter of the UK's carbon emissions. In order to meet the UK's ambitious target of an overall 80% cut in emissions by 2050, extensive decarbonisation of the transport sector will be essential. 90% of all transport emissions are generated from road transport and whilst a considerable proportion of road transport emissions will be addressed through technical developments in car engines and greater use of biofuels, a significant move to greener consumer behaviour is also required.
- 4.67 Walking, cycling, and public transport, including buses and rail, are all alternative green travel options. Persuading and enabling people to use these alternative forms of transport is key in tackling the UK's transport issues; intrinsic to this is ensuring that new developments and key services are accessible.

Delivery

- 4.68 Provision has been made within the illustrative site masterplan for new bus stops to be incorporated into the layout so that all of the proposed housing and facilities can be within a 400m walk distance. The proposal for the application site at Ruabon Park includes the provision of on-site bus stops so that all of the residences and facilities would be within 400m walk distance. The intention is for an existing bus service to be encouraged to divert through the site, passing the foodstore, residential areas, school and then the employment units via the north bound (out) only connection within the site. It is proposed to have bus stops adjacent to the foodstore, school and employment units, with a 'hail and ride' type operation within the residential areas.



-
- 4.69 The site will be accessible by bus for both customers and staff of the proposed retail units and will provide the opportunity for residents of the dwellings to travel to adjacent communities.
- 4.70 The proximity of Ruabon Railway Station will provide the opportunity for future residents to travel by rail with the opportunity for commuting. The potential also exists for staff of the proposed foodstore, school and employment units to travel by rail.
- 4.71 The proposed development will subject to a number of Travel Plans at the reserved matters stage with Travel Plan Co-ordinators appointed with the responsibility of managing and implementing the Travel Plan. Fundamentally, the Co-ordinator will not only promote the Travel Plan, as well as develop targets for implementation and review, but will also act as the liaison between local residential, the Local Authority and Public Transport Operators.
- 4.72 By implementing the objectives of the Interim Travel Plan, a number of benefits to the local residents, visitors, tenants and employees will be realised, These include health benefits, ongoing reduction in vehicular generated traffic on the local highway network and associated travel emissions, and the opportunity to save money by using alternatives to private car use.
- 4.73 Delivery of the above will mean that the proposed development is compliant with the following sustainability criteria:
- CSH/BREEAM – Targeting credits under CSH and BREEAM with respect to safe and secure cycling spaces.

POLLUTION

Sustainability Objective:

To reduce inequalities in the health of the population by improving air quality, and preventing noise and light pollution.

Context

- 4.74 There are many forms of environmental pollution arising from building operation, including noise, odours, light and vibration. A significant proportion of pollution is airborne and is the direct result of fumes, combustion materials, chemicals used in industrial processes, or, polluted air from ventilation systems and air conditioning plants. Some pollutants can also escape to soil and groundwater courses. Internal noise and disturbance to neighbours are also important considerations; and light spill from external lighting can sometimes be an annoyance and aggravation to neighbours.
- 4.75 To reduce the depletion of the earth's ozone layer CFCs are banned under the international 'Montreal Protocol' and HCFCs are being phased out. However, these have often been replaced with HFCs, which have an Ozone Depleting Potential (ODP) of zero but have a high potential to contribute to global warming and the green-house gas effect. The measure of a substance's Global Warming Potential (GWP) is relative to 1 unit of CO₂. Some Halons and HFCs have a GWP in excess of 4,000.
- 4.76 Many substances used in the built environment also contain Volatile Organic Compounds (VOCs). Methane VOCs contain greenhouse gases that contribute towards climate change and non-methane VOCs also have an environmental impact principally related to the formation of ground level ozone or 'smog' that can lead to respiratory problems. In addition, some aromatic compounds (non-methane VOCs) are toxic to human health, considered carcinogens, and are thought to be associated with 'sick building syndrome'.

Delivery

- 4.77 In line with BREEAM and CSH requirements measures which should be actioned in order to ensure that potential forms of pollution associated



with the proposed development will be mitigated at both the construction and operational phases.

4.78 During the construction phase, best practice measures will be undertaken to ensure that potential air, noise and vibration, and water pollution will be effectively managed and controlled. This commitment will include the following measures where feasible:

- Dust Sheets;
- Regular proposals to 'damp' down the site in dry weather;
- Covers to skips etc;
- Compliance with the best practice procedures set out in:
 - PPG 1- General Guide to the Prevention of Pollution, Environment Agency; and
 - PPG 5 - Works In, Near or Liable to Affect Watercourses, Environment Agency.

4.79 It is expected that all insulant materials used in the proposed development will have an ODP of zero and a GWP of less than five in order to minimise the environmental impacts associated with the release of building-related air pollutants. Furthermore, the applicant has committed to ensuring that NO_x emissions arising from the space and water heating for the proposed development will be as low as possible.

4.80 As the proposed units on-site will provide commercial space, as well as residential units, there will be no industrial activities undertaken that could adversely affect the air quality during the operational phase.

4.81 Furthermore, there is a commitment from the team to incorporate best practice measures relating to reducing night time light pollution will also be followed to ensure that external lighting is concentrated in appropriate areas and that upward lighting is minimised, reducing unnecessary light pollution, energy consumption, nuisance to neighbouring properties, and disturbance to local wildlife.

4.82 The above measures will ensure that the proposed development complies with the following sustainability criteria:

- CSH and BREEAM – credits targeted for low VOCs, minimising watercourse pollution, and maximising sound insulation.

4.83 In this way, the team will seek to minimise pollution, with respect to noise, dust/air and surface water, as far as practicable.

ECOLOGY AND BIODIVERSITY

Sustainability Objective:

To conserve and enhance the biodiversity of the region by conserving and enhancing areas valued for their diversity of wildlife, habitats, and landscape value.

Context

- 4.84 Biodiversity is the variability among living organisms within an ecosystem; a highly diverse ecosystem is an indicator of a healthy and thriving natural environment. Since we rely so heavily upon the natural environment it is in our best interest, and the interest of future generations, to protect and enhance the biodiversity that surrounds us.
- 4.85 The UK has seen a dramatic loss in biodiversity and ecosystem integrity especially through the latter half of the twentieth century, therefore, the protection and enhancement of biodiversity is a key component throughout the development process.
- 4.86 Species are currently going extinct at a faster rate than any other time in the history of the earth; at present, approximately 16,000 species are threatened with extinction. There are several methods of incorporating biodiversity enhancing techniques into new developments which can be tailored to certain protected species that are likely to be present.



Delivery

- 4.87 The site survey was undertaken prior to any site preparation or clearance works BSG Ecology was commissioned in November 2012 on behalf of the applicant to undertake an Extended Phase 1 Habitat Survey and desk study. The results of this work are provided within this report.

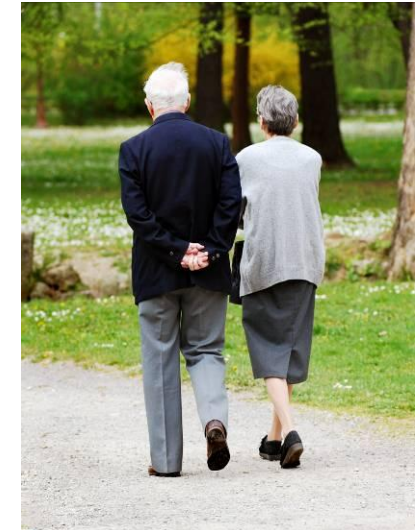
- 4.88 Prior to the work undertaken by BSG Ecology, an outline planning application for a B1 development (High Technology, Manufacturing, Research and Development of Prestige Offices) of the site was submitted in 2003 and was approved in 2005. This planning permission remains extant.
- 4.89 An Ecology Report and Outline Environmental Management Plan were produced by White Young Green (WYG) in September 2003 and March 2007 respectively. The Ecology Report provided details of survey work undertaken between June and August 2003, which included an Extended Phase 1 Habitat Survey, water vole survey, badger survey, one reptile survey visit and a bat transect survey. Amphibian surveys were also undertaken in May and June 2002 and the results of this survey work were summarised within the WYG report.
- 4.90 The survey methods, results and interpretation of the results are detailed in this report combining the Extended Phase 1 Habitat Survey work and the species specific surveys.
- 4.91 The survey area for some species, including bats, breeding birds and great crested newt, was wider than the site boundary. The species specific survey maps show the wider area that was surveyed.
- 4.92 Recommendations for action and/or mitigation/enhancement measures have been identified where necessary in respect of the potential impacts arising from the proposed development. It should be noted that wherever possible the development layout been designed to retain features of ecological interest and value.
- 4.93 The development aims to retain and maintain the majority of habitats of ecological value and adopt appropriate mitigation and compensation measures that will include:
- The removal of Japanese knotweed from the site;
 - The creation of species-rich grasslands;
 - New native tree, hedgerow and scrub planting; T
 - The incorporation of bat roosting opportunities into new buildings;
 - The incorporation of bird nesting opportunities into new buildings;
 - The provision of off-site habitat (within the land holding of the Wynnstay Farming Company Limited) to compensate for the loss of habitat for ground nesting birds.

- 4.94 These measures will be secured through the production of an ecological management plan.
- 4.95 Incorporation of the enhancement recommendations, such as those identified above will enable the proposed development to bring about a positive change in the ecological value of the site, thus providing biodiversity benefits to the local area. The ecological strategy meets and has been designed in accordance with the CSH and BREEAM ecology criteria to ensure the maximum possible number of credits have been targeted by the team under the Ecology categories.

WELLBEING

Sustainability Objective:

To create and sustain vibrant communities, addressing a deficiency in the provision of services to the local community and recognising the needs of everyone.



Context

- 4.96 Well-being differentiates itself from considerations such as standard of living by not focussing solely on economic factors; rather, it is closer in definition to quality-of-life and so takes a more holistic approach. As such, promoting well-being focuses on enabling communities and individuals to live healthy, happy lives. This includes ensuring that individuals have good access to housing, health care, education, open space and commercial opportunities but also that individuals' pursuit of these is not at the detriment of their wider communities' well-being. In this sense, well-being embodies true sustainability in all its three facets: environmental, economic, and social.

Delivery

- 4.97 The proposed development will provide optimum use of the site with a low development density based on local context and design principles.

- 4.98 The proposed scheme has been designed in order to maximise the wellbeing benefits to occupants without detriment to the surrounding buildings and users. As part of the development, private amenity spaces will be provided to create a series of spaces for all residents to enjoy.
- 4.99 In accordance with the requirements of the targeted CSH and BREEAM credits, the proposed development should consider incorporating the principles of *Secured by Design*¹³ to assist in reducing the opportunity for crime and fear of crime to create a safer and more secure environment for the residents and the local community. The applicant should also consider designing all dwellings to comply with the *Lifetime Homes*¹⁴ standard, which will ensure that each home within the proposed development is accessible to everybody and the layout can be easily adapted to fit the needs of future occupants.
- 4.100 The proposed residential led development will provide approximately 300 housing units, which will help to meet the identified need of the local housing shortage. The development includes a mix of 2 to 4 bedroom units, which will help to meet Wrexham's current and future housing needs, and in particular, promote the provision of new family accommodation of both private and affordable housing.
- 4.101 The socio-economic, health, and wellbeing benefits of the proposed development accord with a number of best practice sustainability criteria, including:
- CSH and BREEAM – the majority of health and wellbeing credits have been targeted by the team; and
 - Secured by Design and Policy 24 Design of the adopted Core Strategy – the team are committed to achieving the principles of Secured by Design following consultation with the Architectural Liaison Officer at Hackney Council.

5.0 SUMMARY & CONCLUSIONS

- 5.1 The proposed development is designed to contribute positively to local and national planning policy objectives for sustainable development.
- 5.2 This sustainability statement shows that the proposed development is capable of meeting a number of key policy objectives, responding to local needs and requirements and conforming to current good practice.
- 5.3 The proposed development optimises the use of land by providing a range of different housing opportunities (both private and affordable) as well as local commercial opportunities thus benefiting those living within neighbouring existing local community.
- 5.4 The landscape proposals for the application site will provide ecological enhancement in terms of the ecological value of the new habitats. Finally, the proposed development will bring forward much needed housing, as well as local commercial opportunities that will provide regeneration within the local community.
- 5.5 In summary, the sustainability assessment has informed the design process by identifying opportunities and constraints for sustainable development, and the appraisal process has considerably strengthened the proposals in terms of their sustainability performance. More detailed sustainability strategies will be formulated at the reserved matters stage to demonstrate how the various phases of the development will comply with local and national planning policy requirements in this respect.



6.0 GLOSSARY & ABBREVIATIONS

AQ	Air Quality
BRE	Building Research Establishment
CO₂	Carbon Dioxide
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs.
DfES	Department for Education and Skills
DfT	Department for Transport
DTLR	Department for Transport, Local Government and the Regions
EA	Environment Agency
EIA	Environmental Impact Assessment
Element	A component part of the landscape (e.g. roads, hedges, trees, walls, buildings).
Emission rate	The quantity of a pollutant released from a source over a given period of time.
Enhancement	Landscape improvement through restoration, reconstruction or creation.
Façade	The face of a reflecting object, such as a building
Flood Plain	A flood plain is an area of land over which river or sea water flows or is stored in times of flood.
FRA	An assessment of the potential risks to a development, the likely effects of the proposals on flood risk to others and whether mitigation would be likely to be effective and acceptable.
FSC	Forestry Stewardship Council

GLA	Greater Wales Authority
GEA	Gross External Area
Greywater	Wastewater generated from processes such as washing dishes, laundry and bathing.
Groundwater	Groundwater is water located beneath the ground surface in soil pore spaces and in the fractures of geologic formations.
Heritage	Historical or cultural associations.
HSE	The Health and Safety Executive
IEEM (MIEEM)	Institute of Ecology and Environmental Management (Member of)
IEMA	Institute of Environmental Management and Assessment
LA	Local Authority
Land use	The primary use of land, including both rural and urban activities.
LDF	Local Development Framework
NO₂	Nitrogen dioxide.
NO_x	Nitrogen oxides.
PM₁₀	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
Rainwater Harvesting	Rainwater Harvesting is the collection of water that would otherwise have gone down the drainage system, into the ground or been lost to the atmosphere through evaporation.
RDA	Regional Development Agency
RPG	Regional Planning Guidance
RSS	Regional Spatial Strategy
SPD	Supplementary Planning Document

SPG	Supplementary Planning Guidance
SuDS	Sustainable Drainage Systems: An alternative approach to conventional drainage design and implementation that replicates natural drainage and deals with run-off where it occurs.
Surface Run-Off	Surface run-off occurs when rainfall exceeds a soil's maximum saturation level and all surface depressional storage is filled to capacity.
Sustainability	The principle that the environment should be protected in such a condition and to such a degree that ensures new development needs the needs of the present without compromising the ability of future generations to meet their own needs.
TER	Target Emissions Rate
TSO	The Stationary Office
UDP	Unitary Development Plan

– END –

7.0 REFERENCES

- ¹ DCLG, (2010); *Code for Sustainable Homes – Technical Guidance*, <https://www.gov.uk/government/publications/code-for-sustainable-homes-technical-guidance>
- ² BRE, (2011); *BREEAM New Construction*, http://www.breeam.org/breeamGeneralPrint/breeam_non_dom_manual_3_0.pdf
- ³ HM Government, (1994); *Sustainable Development. The UK Strategy*. TSO
- ⁴ HM Government, (1999); *A Better Quality of Life: A Strategy for Sustainable Development for the United Kingdom*. TSO.
- ⁵ Welsh Government, (2012); *Policy Plan Wales*, <http://wales.gov.uk/docs/desh/publications/121107ppwedition5en.pdf>
- ⁶ Wrexham CB, (2005); *Wrexham Unitary Development Plan*, Wrexham County Borough, http://www.wrexham.gov.uk/assets/pdfs/planning/udp/written_statement_e.pdf
- ⁷ DCLG, (2008). *The Code for Sustainable Homes: Setting the Standard for Sustainability in New Homes*. CLG Publications.
- ⁸ BRE, (2011); *BREEAM New Construction*, http://www.breeam.org/breeamGeneralPrint/breeam_non_dom_manual_3_0.pdf
- ⁷ DCLG, (2010); *Code for Sustainable Homes – Technical Guidance*, <https://www.gov.uk/government/publications/code-for-sustainable-homes-technical-guidance>
- ⁹ BRE, (2008); *The Green Guide to Materials Specification*. BRE. <http://www.thegreenguide.org.uk/login.jsp>
- ¹⁰ Defra, (February 2008); *Future Water The Government's water strategy for England*. TSO.
- ¹¹ Institute of Civil Engineers, Envirocentre, London Remade, (2003); *The ICE Demolition Protocol*. ICE.
- ¹² BSI, (2005); *BS5906 Waste Management in Buildings – Code of Practice*. BSI.
- ¹³ <http://www.securedbydesign.com/>
- ¹⁴ <http://www.lifetimehomes.org.uk/>