West Street, Worsborough

Sustainability Statement

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Contents

1. Introduction

The purpose of this sustainability statement is to provide an overview of the approach to sustainability adopted for the proposed development on land to the south of West Street, Worsborough, Barnsley.

The most readily cited definition of sustainable development is development that, "meets the needs of the present without compromising the ability of future generations to meet their own needs." (Bruntland.1987. Report of the World Commission on Environment and Development).

The UK government recognises the present need to build more houses and the importance of ensuring that these new houses are as sustainable as possible. Sustainability can be quantatively measured against energy use and associated carbon dioxide emissions, along with potable water use and environmental impacts from materials, waste and surface water run-off. A broader measure of sustainability concerns the long-term economic, environmental and social impact of the development.

2. Policy and Guidance

2.1 National Planning Policy

National Planning Policy Framework (March 2012), Department for Communities and Local Government.

The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. The Policy Framework states that, "*The purpose of the planning system is to contribute to the achievement of sustainable development. The policies in paragraphs 18 to 219, taken as a whole, constitute the Governments view of what sustainable development in England means in practise for the planning system.*" (National Planning Policy Framework, Page 2, Paragraph 6)

Paragraph 7 of the National Planning Policy Framework outlines "*three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:*

- *an economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;*

- *a social role – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and*

- *an environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.*

2.2 Local Policy

The local planning authority policy is outlined in the, “Barnsley Local Development Framework - Core Strategy - Adopted September 2011”. Barnsley Metropolitan Borough Council (2011).

3 Supporting Documents

3.1 Flood Risk Assessment on Land at West Street Worsborough, Barnsley South Yorkshire. Document Reference: E12/5820/FRA001 Rev A. Haigh Huddlestone Associates (June 2013).

3.2 Transport Statement – Proposed Residential Development, West Street, Worsborough. Document Reference: 750 / June2013).
PAH Highway Consultants (June 2013)

3.3 Code for Sustainable Homes Pre-Assessment Report

A Code for Sustainable Homes Pre-assessment report has been produced in support of the application and identifies the opportunities and constraints associated with achieving Code for Sustainable Homes Level 3 certification for the development.

The report contains three example routes to level 3 compliance, based on a four bedroom detached dwelling, with and without Solar PV renewables and a 2.5 storey semi-detached dwelling. Each of the three dwelling types demonstrate potential routes to achieving a score higher than the minimum 57.00 point score required for reaching Level 3.
Category credits are consistent for the site-wide categories: Water Use, Surface Water Run-off, Waste, Pollution, Management and Ecology.
Credit variation across the three example dwelling types occurs in the following categories:
Energy & CO^2 Emissions - ‘Ene 7’ credits for Solar PV renewable energy are traded with ‘Ene 2’ credits for increased fabric energy efficiency.
Health and Wellbeing – ‘Hea 2’ credit variation occurs between detached and attached dwellings due to detached dwellings scoring a maximum 4 credits by default. The semi-detached dwelling type scores 3 credits for this category for a robust detail separating wall with a 5dB sound reduction
Credit variation would also be likely for ‘Hea 1’ - Daylighting and ‘Hea 3’ – Private Space when detailed dwelling type information becomes available.

4 Standards and Targets

4.1 Code for Sustainable Homes

The Code for Sustainable Homes (the Code) is an environmental assessment method for rating and certifying the performance of new homes. It is a national standard for use in the design and construction of new homes, with a view to encouraging continuous improvement in sustainable home building.

The Code for Sustainable Homes provides a rigorous and complete measure of the sustainability of new homes and will be used to assess the sustainability of the proposed West Street development across the following categories.

- Energy and Carbon Dioxide Emissions
- Water Consumption
- Environmental Impact of Materials
- Surface Water Run
- Waste Management
- Pollution
- Health and Wellbeing
- Management
- Ecology

In each of these categories, performance targets are proposed which are in excess of the minimum needed to satisfy Building Regulations, but are considered to be sound best practice, technically feasible, and within the capability of the building industry to supply.

The 'Code' uses a rating system of one to six stars and requires mandatory standards to be met for energy use, water use, materials, waste and surface water run-off before even the lowest level of the Code can be achieved. In addition to the mandatory requirements, each design category scores a number of percentage points. The total number of percentage points establishes the 'star rating' for the dwelling.

The 'Code' is recognised in the Barnsley LDF (Section 9.14) "*to measure the energy efficiency and sustainability of all new housing developments, to ensure that they are reaching the standards required*". The proposed development on land off West Street has been set the key requirement to achieve a Code for Sustainable Homes Level 3 rating. Section 6 of this statement will demonstrate how Level 3 accreditation is likely to be reached and follows the categorisation and credit scoring system from the Code for Sustainable Homes Pre-assessment report (See Section 3 of this statement).

4.2 Decentralised, renewable or low carbon energy sources

Core Strategy Policy 5 (CSP 5) of the Barnsley LDF states that , "*All development of 10 or more dwellings will be expected to incorporate decentralised, renewable or low carbon energy sources and other appropriate design measures sufficient to reduce the development's carbon dioxide emissions by at least 15%*" (Barnsley LDF, Page 63). Further clarification is provided by Core Policies 9.30 to 9.34 (Barnsley LDF, Page 64), which detail suitable renewable sources and state that policy will be applied flexibly if it can be demonstrated that such provision would not be technically or economically feasible.

Construction Drawings and SAP Assessments are required for all dwelling types in order to accurately evaluate the technical and economic feasibility of incorporating renewable energy sources to reduce development CO^2 emissions by 15%. As this statement supports an outline application with no detailed technical information, an accurate feasibility study cannot be undertaken. In the absence of the required technical information, a commitment to achieving a stated CO^2 reduction through decentralised / renewable energy sources cannot be made.

It should be emphasised that the objective of LDF Policy CSP 5 is "*to reduce the development's carbon dioxide emissions"* and this can be achieved without the integration of decentralised / renewable energy sources. To achieve a Code level 3 rating, compliance with Part L1A of the current building regulations (Conservation of fuel and power in new dwellings) is required for each of the proposed dwelling types.

Compliance is achieved by demonstrating that the Dwelling Emission Rate (DER), is less than the Target Emission Rate (TER) - the maximum emission rate permitted by current building regulations for each dwelling type.
The building regulations place no emphasis on using decentralised or renewable energy sources for compliance and a 'fabric first' approach as advocated by the Zero Carbon Hub, focussing on high levels of insulation and air tightness, is the logical first step for reducing CO^2 emissions. In consideration of this, a fabric first approach would be likely to be adopted as the most feasible and cost effective route to CO^2 savings for the development proposal. Decentralised / renewable energy sources will be considered following detailed studies into feasibility. The outline feasibility of decentralised and renewable energy sources is discussed later in this statement (Section 6.1.7 – Low and zero carbon technologies).

5 Site Appraisal

Designing a sustainable development has been a consideration from the offset and site opportunities and constraints associated with sustainability were considered and identified at the site appraisal stage.

5.1 Site Description

The site is located on land to the south of West Street, Worsborough, Barnsley and was previously used for general industrial purposes. The site area is approximately 2.17ha and the site contains 5 large buildings. Large areas of hard-standing are present, along with some areas of rough grass and sporadic tree and shrub growth along the south and east boundaries.

5.2 Solar Orientation

The site shape is favourable for solar gain, with the East to West width being approximately 40% greater than the North to South height. This creates an opportunity for the site layout to incorporate a high percentage of housing with either a front or rear elevation with a southerly orientation.

The topography is also favourable for solar gain with a consistent reduction in level from the North of the site to the southern boundary at an average gradient of 1 in 20. This level drop can be utilised to reduce the degree of overshadowing from trees and neighbouring buildings and will assist in making the north–south axis spacing between buildings less critical for both passive solar gain and the incorporation of solar renewable technologies.

5.3 Transport

Local policy emphasises the benefits of providing, "*convenient and integrated accessibility by public transport, cycle and foot and development located to reduce the need to travel,"* (Barnsley LDF, Section 4.12). The following section is taken from the supporting Transport Statement (see Section 3.2) and summarises the accessibility of the site for travel by modes other than the private car.

Walking

"The pedestrian catchment in Appendix B (2km) *includes the whole of Worsbrough and its local services and amenities such as a large supermarket, food outlets, bakers, hairdressers,*

convenience stores, post offices, and a pharmacy. Worsbrough therefore contains good employment potential as a result of the large number of commercial and retail properties. There are 3 primary schools and an academy within this catchment, catering for all school ages". (Para 2.4.7, Page 9).

Cycling Accessibility

"Within a 5km cycle catchment area is the whole of Barnsley Town Centre, together with the neighbouring town of Hoyland, and the village of Birdwell. Barnsley Town Centre in particular offers significant employment, retail, and leisure facilities for the residents of the proposed development". (Para 2.4.8, Page 9).

"The site is also located within cycling distance of the many industrial developments nearby. The industrial properties east of Barnsley Town Centre including the Beevor Industrial estate. The Stairfoot area of Barnsley contains many industrial developments offering significant employment opportunities including Stairfoot Business Park, Grange Lane Industrial Estate, and Oaks Business Park. There are also industrial developments north of Hoyland such as Platts Common Industrial Estate. These industrial areas provide excellent employment opportunities for potential residents of the proposed development and are located within an acceptable cycling distance of the site." (Para 2.4.9, Page 10).

Public Transport Accessibility

"Bus stops are located on or adjacent to West Street within 400m of the centre of the site. The majority of these stops have timetable cases, with the nearby stop on Elmsdale also having the added benefit of a shelter". (Para 2.4.10, Page 10).

"There are up to 2 bus services per hour to the large commercial and retail areas of Barnsley Town Centre. There are also hourly services to the nearby settlements of Hoyland, Wombwell, Darfield, and Great Houghton". (Para 2.4.11, Page 10).

"These bus services also travel to the nearest railway station at Barnsley Interchange. The bus services are therefore considered to be of a good standard and will provide a suitable alternative to the private car in line with current Government guidelines". (Para2.4.12, Page 10).

"The nearest railway station from the application site is Barnsley Railway Station, which is located approximately 3.6km north of the application site. This station provides regular services to Leeds, Wakefield, Sheffield, Nottingham, and the large town of Huddersfield". (Para 2.4.13, Page 11).

"There are excellent train links with services every 30 minutes to the local cities of Leeds, Wakefield and Sheffield, and hourly services to the city and large town of Nottingham and Huddersfield respectively". (Para 2.4.14, Page 11).

Sustainable Travel Options – Summary

"In summary, the site is considered to be in a very sustainable location being within close proximity of the nearest bus stops and within acceptable walking distance of the many local services and amenities within Worsbrough. There are also four schools within this catchment. Within cycling distance of the site there is the whole of Barnsley Town Centre and surrounding industrial properties to the east including the significant industrial areas of Stairfoot. Barnsley Town Centre offers significant employment, leisure, and retail opportunities for the potential residents of the proposed development.

Therefore the site conforms to current Government directives for ensuring developments are located in a sustainable location". (Para 2.4.15, Page 11).

The site is therefore considered to be in a sustainable location in relation to the availability of public transport, walking and cycle provision. It will further the aims and objectives of the Central and Local Government's Sustainable Transport Policy by promoting the use of alternative modes of transport and hence reducing the need to travel by private car. Reducing the reliance on the private car and encouraging walking and cycling is a key objective identified in the Barnsley LDF (Section 8.3, Objective 2), to improve access, movement and connectivity with sustainable travel.

5.4 Flood Risk and Drainage

The Flood Risk assessment produced by Haigh Huddlestone Associates (See Section 3.2) has been directly referenced for the appraisal of Flood risk and Drainage.

Flood Risk

According to the supporting Flood Risk Assessment, "*In our opinion the site is not at risk of flooding from river or tidal water up to a 1% return period nor is it at risk from storms in excess of the 0.1% risk level".* (Para 6.5).

"The site currently falls with flood zone 1 as shown on the Environment Agency Websites. The development is classified as More Vulnerable in Table 2 of the Technical Guidance to the National Planning Policy Framework March 2012 and table 3 of that document also states that the proposed residential development is appropriate". (Para 6.1).

Existing Foul Drainage

"The nearest Public sewers are an existing 305 mm dia. foul sewer and a 225mm surface water sewer that run in West Street. These both fall from the east to west and are recorded as 2.3 to 3m deep. There are also combined sewers running to the south of the site on the opposite side of the canal. These are shown as 750mm and 450mm diameter with depths of 1.45m to 1.65m deep. To the east of the site is a 450mm diameter combined sewer that runs north to south approximately 50m to the east of the site boundary. There is also a 600mm diam surface water sewer that runs north to south through open fields approx 85m to the east of the site and discharges to the River Dove 80m to the south west of the site close to Powder Mill Lane Bridge over the river". (Para 3.1)

"The depth of the combined sewers in West Street do not appear to be sufficient to service the whole site by gravity. This may be possible however if there is a significant amount of ground raising in the south of the site. Alternatively the provision of a Foul Water Pumping Station may be needed to ensure the whole site can be drained and allow a full development of the site". (Para 3.2).

Existing Surface Water Drainage

"Yorkshire Water report that there is no capacity for increased surface water discharges from the site in the existing public sewerage system. They have requested that the use of sustainable drainage systems are fully investigated prior to approval of any discharges from site. They recommend the River Dove as a suitable point of discharge subject to land drainage and Environment agency approvals. Any discharge of surface water from the site will have to be attenuated down to existing discharges from the site which may even reduce to an agricultural discharge rate of 5Lit/sec/ha despite the site being previously developed. In the first instance the use of infiltration methods should be investigated".(Para 3.3)

6 The Code for Sustainable Homes – Category Considerations

The predicted category scores detailed below show a potential route to achieving the 57 points required for Code Level 3 compliance. The predicted scores are not a formal part of the Code for Sustainable Homes assessment process and are for guidance only. It is likely that category scores will differ between dwelling types following a formal assessment, when all required information shall be made available (Construction Drawings, SAP Assessments etc). It should be noted that although the actual category credits awarded are likely to change following formal assessment, a commitment to achieving a minimum total score of 57 points, to achieve Code Level 3 standard will be made.

6.1 Energy Use and Carbon Dioxide Emissions

6.1.1 Category Ene 1 – Dwelling Emission Rate

To successfully achieve Code level 3 rating and meet local policy targets, it is mandatory to achieve an improvement in the Dwelling Emission Rate (DER), (estimated carbon dioxide emissions in kg per m² per annum arising from energy use for heating, hot water and lighting for the actual dwelling), over the Target Emission Rate (*TER*) (the maximum emission rate permitted by current building regulations).

The improvement is measured against current Part L Building Regulations, which came into effect in October 2010 and introduced a mandatory 25% improvement in energy use and associated carbon dioxide emissions over the previous 2006 regulations.

Each dwelling type will be assessed individually with differing construction and component specifications allowing each house type to exceed the mandatory minimum standard of energy efficiency in the most practical and cost effective way.

The principal design measure to reduce emission rates involves providing a well insulated and air-tight building fabric. This ‘fabric first’ approch is advocated by the Zero Carbon Hub, an organisation that was established to support the delivery of zero carbon homes.
High efficiency boilers and heating controls will also make a significant contribution to achieving the required energy efficiency target.

Additional energy efficiency measures that are likely to be incorporated include the use of energy display devices to empower occupants to reduce energy use, energy efficient compact fluorescent lighting and energy labelled white goods.

Further associated energy savings could be made by providing a home office space and encouraging sustainable transport. It is likely that dedicated cycle storage, proportionate to the number of bedrooms, will be provided for each dwelling.

The site layout has been designed to ensure that a large proportion of the dwellings (approximately 70%) have a front or rear elevation and roof orientation within 30º of due south. The site also features generous spacing between buildings and trees, which ensures that overshadowing does not compromise available solar gains. Providing a suitable roof mounting space for Solar Photo-Voltaic (PV) panels ensures an effective and robust future upgrade path for the utilisation of zero carbon technologies. A south-facing orientation also provides increased solar gain through glazing, helping to reduce energy consumption for space heating.
Credit score variation across dwelling types will be likely for the ‘Ene 1’category.

6.1.2 Category Ene 2 – Fabric Energy Efficiency

Improving the fabric energy efficiency performance of the dwellings is considered to be future-proofing reductions in Carbon Dioxide emissions for the life of the dwelling.
A range of fabric energy efficiencies and associated credit scores are likely, depending on the dwelling type and configuration.
An averaged credit score of 4 has been assumed for dwelling types that don't have an efficiency contribution from renewable energy. An average credit score of 3 has been assumed for dwelling types that are specified with a renewable energy source, demonstrating the reduced requirement for fabric energy efficiency to meet the required standard.

6.1.3 Code Category 'Ene 3' – Energy Display Devices

Selected dwellings will be provided with an energy display device to display current electricity consumption data. This will empower dwelling occupants to reduce energy use.
Typically 1 credit will be awarded for the 'Ene 3' category.

6.1.4 Code Category 'Ene 4' – Drying Space

Each house would be provided with a dedicated drying facility in the form of a rotary clothes dryer or washing line, to be located in the secure rear garden.
Apartments would be provided with an internal drying line.
1 credit will be awarded for the 'Ene 4' category.

6.1.5 Code Category 'Ene 5' – Energy Labelled White Goods

Carbon dioxide emissions from each dwelling will be minimised through the provision of energy efficient appliances rated by the EU energy labelling scheme.
It is anticipated that 'A' rated Washing Machines and dishwashers and 'B' rated Washer-dryers or tumble dryers will be provided.
2 credits will be awarded for the 'Ene 5' category.

6.1.6 Code Category 'Ene 6' – External Lighting

All external lighting will be specified as dedicated energy efficient and will feature a daylight shut-off sensor.
2 credits will be awarded for the 'Ene 6' category.

6.1.7 Code Category 'Ene 7' – Low and Zero Carbon Technologies

As discussed in Section 4.2 of this statement, decentralised and renewable energy sources are to be considered for the proposed development, in consideration of Barnsley LDF Core Strategy Policy 5 (Including Renewable Energy in Developments).

The outline feasibility of decentralised and renewable energy sources is discussed below. It should be noted that detailed feasibility studies will be required when the layout and dwelling designs are finalised.

Decentralised Energy Sources

The development size is not considered suitable for incorporating Combined Heat and Power (CHP) and/or District Heating systems. Additionally, there are a number of suitability factors that should be taken into account.

The viability of Combined Heat and Power (CHP) according to the Carbon Trust guide 'Introducing combined heat and power' is reliant upon the plant being operational for around 17 hours each day for the whole year. The only heat demand that is relatively consistent throughout the whole year would be for hot water. Heat demand for space heating would obviously have a pronounced seasonal variance, with little requirement for the CHP to be operational for long periods during the summer. As the proposed development is wholly residential, the demand for both hot water and space heating would be subject to daily demand peaks in the mornings and evenings with reduced demand during working hours.

Investment cost and efficiency losses from heating pipelines would be significant as a result of the relatively low development density and substantial green space area which separates the site into two residential areas. 'Linking up' with an existing community heating / CHP development is also not an option as there are no suitable developments close to the site.

The viability of a Biomass District Heating system has also been evaluated and is again subject to the same problems of high installation cost and reduced operational efficiency and financial viability due to the inconsistent residential heating demand. These problems are highlighted in the Carbon Trust document, 'Biomass heating – A practical guide for potential users' (Carbon Trust, 2009, Section 3.1.1, p54). "*Biomass heating systems generally have higher initial capital cost than fossil fuel systems of equivalent rated capacity. However, this difference can be recouped through annual fuel cost savings. Given this, biomass heating tends to be most cost-effective in:*
Situations which are off the national gas grid. The capital recovery from the annual fuel cost savings is fastest when biomass heating replaces heating oil, LPG or electricity in off-grid sites.
Situations, which have relatively consistent and high heat loads. The more the biomass boiler is used in meeting the heat demand (higher capacity factor), the greater the impact of the fuel cost savings on the payback of the capital expenditure."

The financial viability of any Community Heating / CHP System, using either Biomass or a combination of energy sources is calculated by comparing the initial capital costs associated with the installation of the plant and heating network construction with the annual running cost savings, to give a pay back period for the initial investment.
Financial viability is difficult to achieve for a conventional residential development with individual dwellings sold for private tenure, as proposed in this application.

Renewable Energy Sources

Code category 'Ene 7' credits are awarded when certain Low and Zero Carbon Technologies (renewables) are utilised to reduce CO^2 emmisions. Appendix M of the Standard Assessment Procedure for Energy Rating of Dwellings (SAP 2009) states that Photovoltaic (PV) technology, small and micro wind turbines and small-scale hydro-electric generators are acceptable technologies.

Hydro-electric

Hydro-electric generation is possible in only a small number of situations where a suitable flowing body of water with a drop in level is present. No such watercourse is present at the proposed site therefore this renewable technology can be discounted.

Wind Turbines

Building mounted wind turbines are still considered an emerging technology whose feasibility is dependant upon wind speed at the site.

Wind conditions would have to be monitored at the site to confirm feasibility, but a turbulent wind profile is likely due to surrounding trees and buildings. This would reduce the efficiency of wind turbine installations and increase payback periods. There are additional concerns regarding possible structural strengthening for roofs, aesthetic impact, intermittent output and maintenance costs. For these reasons wind power has been rejected as a viable renewable energy source for the development at land off West Street.

Solar Photovoltaic (PV)

Photovoltaic technology converts daylight directly into electricity. It works during daylight hours but more electricity is produced when the sunshine is more intense (a sunny day) and is striking the PV modules directly. The efficiency of the PV installation is directly affected by orientation (up to 45º from due south is acceptable), pitch (30º to 45º gives the best output) and any shading that falls on the panels.

The site layout has been designed to ensure that a large proportion of the dwellings (approximately 70%) have a roof orientation within 30º of due south (See fig.1). All dwelling types are expected to have a roof pitch within the range of 30º to 45º and the topography of the site will help reduce shading. Subject to shadow and full feasibility study it is expected that the output of PV arrays on dwellings with a suitable orientation would be good.

Fig1 – Layout showing dwellings with orientation to maximise Solar Gain

Summary of Renewable Energy Technologies

Following a review of development opportunities and constraints whilst consulting recognised guidance on renewable technologies, it has been decided that the most suitable renewable technology that is acceptable for Code category 'Ene 7' credits is roof -mounted Solar Photovoltaic (PV) panels.
A full feasibility study by a solar renewable technology expert should be undertaken to establish the exact number of dwellings that have a suitable orientation and roof area for Solar PV. Factors such as installation cost and maintenance requirement should also be considered, along with available incentives in the form of the governments Feed in Tariff (FIT) to establish whether installing Solar PV on suitable dwellings is cost effective when compared to a fabric first approach to reducing CO^2 emissions.
A SAP calculation would be required to work out the CO^2 reduction from installed PV's for all suitable dwellings. Depending on baseline emissions and PV sizing according to roof area, suitable dwellings would be awarded either 1 Code credit (for a 10% reduction) or 2 Code credits (for a 15% reduction).

6.1.8 Code Category 'Ene 8' – Cycle Storage

All houses would feature dedicated cycle storage with 2 & 3 bedroom houses having space for 2 cycles. 4 bedroom houses will have space for either 2 or 4 cycles. It is assumed that the storage area will provided in the rear gardens of dwellings. Communal storage facilities could be provided for apartments.
Typically 2 credits would be awarded to housesfor the 'Ene 8' category.
Credits could be awarded for apartments subject to the provision of communal storage.

6.1.9 Code Category 'Ene 9' – Home Office

The provision of a home office will reduce the need to commute to work by providing residents with the necessary space and services to be able to work from home. A necessary space is defined as a minimum 1.8m wall length to allow a desk, filing cabinets etc to be installed and sufficient services include 2 double power sockets, 2 telephone points (one point where broadband or cable are available), a window providing a suitable level of daylight and ventilation.
1 credit will be awarded for the 'Ene 9' category to all dwellings with a room suitable for conversion to a home office.

6.2 Water use

6.2.1 Code Category 'Wat 1' – Indoor Water Use

To successfully achieve the required CSH level 3 compliance it is mandatory to limit potable water consumption within each household to less that 105 litre's per person per day. This amounts to a 30% reduction in potable water consumption compared to the current national average.
This high level of water efficiency will be achieved through the provision of water efficient appliances including low-flush WC's, flow restricted 'aerating' taps, reduced capacity baths and low water use showers. The resultant average water consumption from these appliances and fittings will be calculated the with the CSH Water Calculator tool , which calculates consumption based on the Wrc (Water Research Centre) report, CP187, P6832, March 2005.
3 credits will be awarded for the 'Wat 1' category.

6.2.2 Code Category 'Wat 2' - External Water Use

Rain water will be collected in rainwater butts and used to irrigate private gardens. Recycling rainwater for this purpose not only reduces the consumption of potable water but also has the secondary benefit of reducing surface water run off.
1 credit will be awarded for the 'Wat 2' category for houses.
The credit would also be awarded by default to apartments with no individual or communal garden spaces.

6.3 Materials

6.3.1 Code Category 'Mat 1' – Environmental Impact of Materials

In consideration of the mandatory requirement for the 'Mat 1' Category of the Code for Sustainable Homes at least three of the following five elements of the building element will achieve a Green Guide rating between A+ and D; Roof, External Walls, Internal Walls, Upper and Ground Floors and windows.
The Green Guide is a rating system for the embodied environmental impacts of construction products and materials.

It is likely that different dwelling types will achieve varying credit scores in the Mat 1 category, due to differing dwelling design and specification. The minimum mandatory credit scores will be comfortably surpassed through a commitment to specifying materials with a low environmental impact.
Typically 8 out of 15 credits will be awarded for the 'Mat 1' category.

6.3.2 Code Cat 'Mat 2' – Responsible sourcing of Materials – Basic Build Elements

Chain of custody information will be obtained to ensure that basic building element materials are responsibly sourced.
Typically 4 out of 6 credits will be awarded for the 'Mat 2' category.

6.3.3 Code Cat 'Mat 3' – Responsible sourcing of Materials – Finishing Elements

Chain of custody information will be obtained to ensure that finishing element materials are responsibly sourced.
Typically 2 out of 3 credits will be awarded for the 'Mat 3' category.

6.4 Surface Water Run-off and Flood Risk

6.4.1 Code Category 'Sur 1' – Surface Water Run-off

The aim of this credit is to design surface water drainage for housing developments which avoid, reduce and delay the discharge of rainfall run-off to watercourses and public sewers using Suds techniques. This will protect receiving waters from pollution and minimise the risk of flooding and other environmental damage in watercourses.

The Code for Sustainable Homes Category 4: Surface Water Run-off contains a mandatory requirement to, "*ensure that the peak rate of runoff into watercourses is no greater for the developed site than it was for the pre-development site (the state of a site immediately before the development under assessment*)". The Mandatory requirement for Peak Rate of Run-Off and Annual Volume of Run-Off to be no greater post-development would be met.

6.4.2 Code Category 'Sur 2' – Flood risk of the development

For compliance with the requirement of Barnsley LDF Core Strategy Policy 4 (CSP 4) 'Flood Risk' no development will be granted contrary to Environment Agency advice on flooding. According to the supporting Flood Risk Assessment (See Section 3.1), "The site currently falls with flood zone 1 as shown on the Environment Agency Websites. The development is classified as More Vulnerable in Table 2 of the Technical Guidance to the National Planning Policy Framework March 2012 and table 3 of that document also states that the proposed residential development is appropriate.
2 credits are awarded for the 'Sur 2' category.

6.5 Waste Management

6.5.1 Code Cat 'Was 1' - Storage of Non-Recyclable and Recyclable Waste

To assist in the achievement of the Governments targets for the reduction of Landfill and to encourage waste recycling, adequate internal and external storage space for both non-recyclable waste and recyclable household waste will be provided.
The mandatory requirement for adequate storage of household waste will be met. A Local Authority Recycling Collection Scheme has been assumed and appropriate internal and external storage of recyclable materials will be provided for each dwelling. All containers will be appropriately sized, accessible to disabled people and sited on a hard, level surface.
4 credits will typically be awarded for the 'Was 1' category.

6.5.2 Code Cat 'Was 2' - Construction Site Waste Management

It is likely that a Site Waste Management Plan will be implemented and contain Benchmarks, Commitments and Procedures for Waste Minimisation.
1 credit would typically be awarded for the 'Was 2' category.

6.5.3 Code Cat 'Was 3' - Composting Provision

Dedicated composting facilities would be provided for all dwellings with a suitable private garden, in a position providing inclusive access and usability. An information leaflet would also be provided.
1 credit will be awarded for the 'Was 3' category for houses with private gardens.

6.6 Pollution

6.6.1 Code Cat 'Pol 1' - Global Warming Potential of Insulants

Insulation materials with a low Global Warming Potential from blowing agent emissions will be selected.
1 credit will be awarded for the 'Pol 1' category.

6.6.2 Code Cat 'Pol 2' – Nox Emissions

'Nox Class 4' condensing boilers will be specified, to reduce the emission of nitrogen oxides (Nox) arising from the operation of space heating and hot water systems.
1 credit will typically be awarded for the 'Pol 2' category.

6.7 Health and Wellbeing

6.7.1 Code Cat 'Hea 1' - Daylighting

Energy efficient buildings should make full use of natural daylight to improve both energy efficiency and health and wellbeing for occupants. Dwelling designs will feature generous window areas to maximise daylighting. Subject to daylight factor calculation confirmation it has been assumed that dwellings will feature a minimum Daylight Factor of at least 1.5% in the Kitchen, Living Room and Dining Room, scoring 2 credits for the 'Hea 1' code category.

6.7.2 Code Cat 'Hea 2' - Sound Insulation

The performance of the separating elements of attached dwellings will achieve a standard of sound insulation equal to or greater than the standard required for compliance with Building Regulations Approved Document E. This will reduce the likelihood of noise complaints amongst neighbours.
Robust Details are to be utilised for the separating walls between dwellings and separating walls and floor between apartments. To obtain additional credits certain dwellings may use an enhanced specification to achieve an additional 5dB reduction in Impact and Airborne sound transmission.
Where this specification is used 3 credits will be awarded for the 'Hea 2' code category. Detached dwellings are awarded 4 credits by default.

6.7.3 Code Cat 'Hea 3' - Private Space

Generous rear garden areas will be provided for each house, to provide a private space that is comfortably more than the required minimum for Code credit scoring, of 1.5 m² per bedroom. 1 credit will typically be awarded for all dwellings with the exception of apartments.

6.7.4 Code Cat 'Hea 4' – Lifetime Homes

Lifetime Homes is an assessment methodology to promote the construction of homes that are accessible and easily adaptable to meet the changing needs of current and future occupants. It is unlikely that dwellings will be designed to comply with the Lifetime Homes standards as the 16 criteria can be onerous to achieve in smaller dwellings and can compromise internal layout design. Individual dwellings could be adapted to the Lifetime Homes standard if a request was made prior to construction. Typically though, 0 credits would be awarded for the 'Hea 4' category.

6.8 Management

6.8.1 Code Cat 'Man 1' - Home User Guide

A compliant Home User Guide will be produced and provided to each dwelling. The guide will include additional information relating to the site and its surroundings.
3 credits would be achieved for the 'Man 1' code category.

6.8.2 Code Cat 'Man 2' - Considerate Constructors Scheme

The site is likelty to be registered with the considerate constructors scheme and a best practice score of between 24 and 31.5 with a minimum score of 3 in all sections is assumed. 1 credit would be achieved for the 'Man 2' code category.

6.8.3 Code Cat 'Man 3' - Construction Site Impacts

The aim of this category is to promote the management of construction sites to mitigate environmental impacts during the construction process.
It is anticipated that procedures will be put into place to monitor, report and set targets for water consumption from site activities. A commitment would also be made to adopt best practice policies in respect of air (dust) and water (ground and surface) pollution and ensure a minimum of 80% of site timber is responsibly sourced.
With these measures in place 2 credits would be awarded for the 'Man 3' category.

6.9 Ecology

Ecological value is an important factor when considering the sustainability of the proposed development and is influenced by the previous use of the site, the presence of existing ecological features and proposed ecological enhancements.

6.9.1 Code Cat 'Eco 1' - Ecological Value of the Site

The majority of the site is occupied by hardstanding and overgrown rough grassland with a relatively small number of trees, of low amenity value, limited to the south and east boundaries of the site. The majority of the ecological value of the existing site is therefore concentrated along these boundary areas.
It should be noted that strict criteria are used to establish the ecological value of a site in the Code for Sustainable Homes and the presence of any trees or hedges above 1m high dictates that the site has ecological value. Therefore 0 credits can be awarded for the 'Eco 1' category.

6.9.2 Code Cat 'Eco 2' - Ecological Enhancement

It is likely that a suitably qualified ecologist will be employed to make recommendations for the ecological enhancement of the development. It is anticipated that all key recommendations and a minimum of 30% of additional recommendations will be adopted with 1 credit awarded for the 'Eco 2' category.

6.9.3 Code Cat 'Eco 3' - Protection of Ecological Features

Appropriate measures would be taken to protect retained existing ecological features from substantial damage during the clearing of the site and the completion of construction works. Credit scoring in this category is dependant on the number and location of ecological features identified for retention by a suitably qualified ecologist.
1 credit is likely to be awarded for this category.

6.9.4 Code Cat 'Eco 4' - Change in Ecological Value of the Site

The aim of this credit is to minimise reductions and promote an improvement in the ecological value of the site, post development. Ecological value is measured before and after development with recommendations from a suitably qualified ecologist implemented to increase ecological value.

The greenway connection path that bisects the site in a north-south direction would provide a green corridor for wildlife and result in a marked increase in biodiversity. Additionally, ecological improvement measures detailed by a suitably qualified ecologist, such as the planting of nectar rich plant species, would result in a minor enhancement to the ecological value of the site and the awarding of 3 'Eco 4' credits. It should be noted that confirmation of these credits is dependant on the advice of a suitably qualified ecologist.

6.9.5 Code Cat 'Eco 5' - Building Footprint

This credit promotes and rewards the most efficient use of a building's footprint by ensuring that land and material use is optimised across the development. As this document supports an outline application the storey height mix of dwellings has not been decided. It is highly likely however, that 2 storey dwellings would feature in the development, therefore the site-wide 'Eco 5' credits could not be awarded for any dwelling types.

7 Conclusion

Although this sustainability statement supports an outline application without detailed house type and layout information, the sustainability of the proposed development can be measured by the commitment to achieving a level 3 Code for Sustainable Homes rating for the development. Achieving a Code level 3 rating will ensure that a holistic approach to sustainability will be adopted and a high standard of sustainable design reached.

The proposed development will make a contribution to the present and recognised need for sustainable housing within Barnsley, in a location that will encourage sustainable alternatives to car travel.

A high proportion of the proposed housing has a south orientation and generous spacing to ensure useful solar gains and good daylighting. These measures will help to minimise housing energy use and carbon dioxide emissions regardless of specific house type design. Subject to a full feasibility study, south orientated dwellings will provide an opportunity to reduce carbon dioxide emissions through the incorporation of roof-mounted renewable energy technologies.

Additional measures will be taken to ensure the efficient use of natural resources such as water and reduce environmental impacts from materials, pollution, waste sent to landfill and surface water run-off.

The proposed layout would preserve the majority of ecologically valuable features along the south and east boundaries of the site and the landscape proposal incorporates a number of new ecological features with the aspiration to increase the ecological value of the site through the introduction of a green corridor and garden planning featuring nectar rich plant species.

These measures respond to the National Planning Policy Framework ‘three dimensions’ of sustainable development; economic, social and environmental, and address issues identified in the Sustainability and Climate Change section of the current Barnsley LDF document (Sections 4.12, 4.15 and 4.16). A broad measure of the sustainability of the proposed development is that it will contribute to, “securing sustainable development within Barnsley to meet its environmental, economic and social needs” (Barnsley LDF-Core Strategy. Section 4.12, Page 18)