Chorley Borough
Local Development
Framework

Chorley into 2016: Sustainable Resources

Supplementary Planning Document

First Draft – March 2006

Chorley
Borough Council

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આ માહિતીનો અનુવાદ આપની પોતાની ભાષામાં કરી શકાય છે. આ સેવા સરળતાથી મેળવવા માટે કૃપા કરી, આ નંબર પર ફોન કરો: 01257 515822

ان معلومات کا ترجمہ آپ کی اپنی زبان میں بھی کیا جا سکتا ہے۔ یہ خدمت استعمال کرنے کیلئے براہ مہربانی اس نمبر پر ٹیلیفون کیجئے: 01257 515823

Sustainable Resources
Supplementary Planning Document
First Draft – March 2006

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How to Make Representations

This draft document has been prepared for consultation and community involvement.

Representations can be made in any of the following ways:

By post Planning Policy Section
Chorley Borough Council
Council Offices
Gillibrand Street
Chorley
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PR7 2EL

By fax 01257 515211

By e-mail planning.policy@chorley.gov.uk

For representations to be considered they must be received by the Planning Policy Team no later than 5pm, X April 2005

1. Introduction

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs defines the concept of sustainable development, which is the core principle underpinning the planning system. Two integral elements of sustainable development, as set out by the Government's sustainable development strategy, are the effective protection of the environment and the prudent use of natural resources. Using resources including energy (and those natural resources used to generate energy), materials and water sustainably through minimising use, maximising efficiency and recycling has wide reaching social, economic and environmental benefits.

1.1 In order to promote sustainable development and in particular the sustainable use of natural resources in Chorley, the Council is drafting a Sustainable Resources Development Plan Document (DPD). The objectives of the Sustainable Resources DPD and this Supplementary Planning Document (SPD) are to:

A. Increase year on year installed renewable energy capacity in the Borough;
B. Impose increased year on year targets for the energy requirements of buildings met by on-site renewable energy provision;
C. Promote the reduction of energy requirements in new developments;
D. Require the use of construction materials which have been re-used or come from sustainable sources;
E. In new developments, minimise waste production and encourage the recycling of waste products;
F. Manage water in a sustainable manner reducing consumption and making greater use of recycled water in new development;

1.2 The spatial vision for Chorley for the use of sustainable resources is:

"That by 2016, the principles of sustainable development and, in particular, a positive attitude to reducing carbon emissions, will run through all development activity, with Chorley Borough acknowledged as a leading authority with residents and businesses reaping economic, social and environmental benefits"

A positive attitude towards reducing carbon emissions should include the consideration of 'carbon neutral' development where the contribution to greenhouse gas emissions is reduced to zero.

1.3 Sustainability Appraisal testing has been carried out on options relating to each of these objectives and the results of this testing have informed the policies of the DPD and the content of this SDP. The purpose of this document is to supplement the policies in the DPD through the provision of practical advice on how to incorporate the sustainable use of resources into new development. The document also provides further detail on the criteria that will be applied when assessing planning applications for renewable energy schemes. Once adopted both the Sustainable Resources Documents will form part of the new Local Development Framework for Chorley, replacing parts of the Chorley Borough Local Plan Review adopted in August 2003.

1.4 Normally built developments require at least two types of approval – planning permission and Building Regulations consent. Applications seeking planning permission are considered in terms of siting, location, means of access, external appearance and landscaping. All of these have sustainability implications. The Building Regulations are more concerned with ensuring that buildings are well built in terms of meeting minimum construction standards and are safe to use. However the scope of the Building Regulations is expanding and increasingly energy efficiency requirements are becoming more prominent. There are other forms of consent that apply to developments affecting Listed Buildings (those of architectural or historic importance) and in Conservation Areas. This Supplementary Planning Document is primarily concerned with planning requirements but some of these will be backed up through the implementation of the Building Regulations although developers will be encourage to exceed these standards. Further information on other construction standards is referred to in the Appendices.

1.5 Note: for clarity, the key points made in this document have been italicised.

2. Background

In July 2004, Sustainability Northwest, on behalf of Renewables Northwest, produced the report 'Opportunities for Renewable Energy in Chorley' following a study involving both organisations and the Borough Council which sought to explore the potential for renewable energy within the authority's boundaries. The impetuous for the study was provided by a variety of international, national and regional policies, most notably the Government's commitment to tackle climate change by reducing carbon dioxide emissions and increasing renewable energy generation. These are reflected in revisions to national planning guidance on renewable energy, Planning Policy Statement 22, which provides for a positive planning framework to guide regional and local planning policies. Further discussion of the policy background is set out in the Sustainable Resources DPD.

2.1 The above mentioned report recommended the development of planning policy that positively and strongly guides the development of renewable energy in the Borough. The Sustainable Resources DPD and this SPD seek to take forward this recommendation within the wider context of sustainable resources use. Alongside the promotion of renewable energy, energy use, recycling, the use of materials used in development and water use are all covered as each is an important element in the prudent use of natural resources and in protecting the environment.

3. Energy Use

The principle methods by which our energy use can be made more sustainable are by improving the efficiency with which energy is used, reducing waste and unnecessary use, and increasing the proportion of renewable energy used relative to other sources (see Section 7). Buildings account for most of the UK's carbon dioxide emissions. Dwellings alone account for 30% of UK energy consumption and 28% of the resulting CO2 emissions, much of which is derived from heating and cooling systems, hot water use and from household appliances. Reducing energy use through conservation and greater efficiency is therefore vitally important in reducing carbon dioxide emissions and tackling climate change. A range of technologies, techniques and approaches exist for improving energy efficiency, which can be both cost effective and simple.

3.1 *In accordance with the objectives of the Sustainable Resources Development Plan Document, new development will be expected to minimise energy use and maximise energy efficiency, particularly through considered design and layout. Applicants for new development are required to provide evidence demonstrating the following factors have been considered, and where possible incorporated, into the design of new and refurbished buildings.*

3.2 <u>*Energy conservation*</u>

Alongside reducing the amount of energy we use it is equally important to ensure what energy we do use is used efficiently and as little as possible is wasted. There are many cheap and simple techniques for improving energy efficiency including eliminating draughts, ensure heating and water temperatures are not too high, turning off lights and electrical equipment and ensuring washing machines and dishwashers are full before use. In addition such 'white' goods now come with a European Union energy label which classifies their energy rating from A (most efficient) to G (most inefficient). This assists consumers to choose energy efficient products.

3.3 The most effective way to ensure the energy efficiency of dwellings, offices, industrial units and other buildings is during their construction (or refurbishment). Most building work requires Building Regulations approval, either from the Council or an approved inspector. The Building Regulations exist to ensure the health and safety of people in and around all types of buildings. In addition to this function, changes to the Building Regulations coming into effect in April 2006 outline measures to make buildings more energy efficient. Part L of the Building Regulations sets out standards for building work in order to conserve fuel and power and minimise heat loss, raising energy efficiency standards through the use of more energy efficiency materials and methods. Developers should see the Building Regulations as a *minimum* requirement for ensuring the energy efficiency of buildings.

3.4 *Passive Solar Design*

The energy provided by sunlight entering buildings through windows – passive solar energy – can make a significant saving in the energy needed for heating and lighting and so reduce the carbon dioxide emitted by burning fossil fuels. The objective of Passive Solar Design is to optimise energy and light from the sun by using simple design methods. These methods apply to both site layouts that optimise passive solar gain and building designs that take advantage of solar energy and thus give rise to maximum energy savings. Good Passive Solar Design balances maximising the capture and use of passive solar energy in the winter which allows reduced energy consumption with the prevention of excessive solar gain during the summer which can cause discomfort or heat stress and increase the demand for energy for cooling. In addition to reducing the energy needed for heating and lighting Passive Solar Design can therefore also reduce the need for ventilation e.g. air conditioning.

3.5 Designing new developments to maximise passive solar energy provides a number of benefits. Applying simple layout and building design principles can save up to 25% of heating and lighting energy costs in modern housing. This need cost no more than conventional developments and as this method is not technology dependent there are no ongoing cost implications. When applied as part of an overall approach towards reducing the need for conventional energy sources (i.e. fossil fuels) in providing heating, lighting and ventilation in conjunction with other low energy and efficiency measures, Passive Solar Design can result in 'zero energy buildings'. In order to maximise the benefits of good Passive Solar Design it must be considered early in the design stage of new development as this represents the best opportunity to save energy during the lifetime of a building. It is also important to consider the purpose of the building as the heating and lighting requirements of some commercial buildings may be different to housing.

3.6 The application of Passive Solar Design may be constrained to an extent by building and location specific factors, particularly relating to design. Passive Solar Design provides scope for interesting architecture using varied layouts, designs and detailing based around both traditional and contemporary themes. The specific architectural treatment chosen in each case will need to be considered on a site specific basis and should become clear to the developer following a contextual analysis of the site and its surroundings. It is often the case that the incorporation of Passive Solar Design into architecture will lead to a strong contemporary design theme being adopted. The use of such design themes may be acceptable within the correct context. It may be, however, that such a design would be damaging to the streetscape in the wrong location. Care should therefore be taken when proceeding with unconventional contemporary design to ensure that the impact of the design does not cause detriment to its surroundings.

3.7 Passive Solar Design within architecture is not confined to contemporary design as it can also be applied equally to housing and commercial developments which have an entirely conventional appearance. Much of the development of traditional architectural forms has been based upon the principles of Passive Solar Design, which were especially important before the incorporation of widespread central heating systems and have their origins in vernacular architecture pre-dating the Industrial Revolution.

3.8 Not all aspects of Passive Solar Design can be controlled by the planning system, for example the use of dense materials to store heat, the details of internal orientation and the use of natural ventilation but Planning Policy Statement 22 does confirm that the consideration of solar heat and light capture through the use of Passive Solar Design is a normal planning matter. The main principles of Passive Solar Design that should be addressed include:

- *Orientation:* Careful orientation of buildings is vital for passive solar energy gains. Buildings should generally be orientated with the longest face within 30 degrees of south to maximise solar gain in the winter and limit summer overheating because of the high angle of the midday sun. South easterly orientation is generally preferable to south westerly as this maximises early morning gains and reduced the likelihood of overheating in the afternoon.

- *Road layout:* In order to enable the optimum orientation for buildings for passive solar gain, roads in new development should be aligned east-west where possible. On north-south roads, detached units provide greater flexibility for maximising solar gain, while plots should be set at an angle to diagonal roads. Once again the key to achieving a successful layout that provides

Passive Solar Design whilst retaining the character and cohesion of the streetscape is an early assessment and consideration of the context of the application site.

- *Internal layout:* Rooms used most often for living and working should be positioned in the south facing part of the building while rooms that benefit less from sunlight (such storerooms, bathrooms and toilets) on the north side. Kitchens are also better positioned on the north side to avoid excessive heat gain.

- *Window sizing and position*: Well orientated buildings with optimum internal layouts will not require especially large south-facing windows – if windows are too large, over heating may occur in the summer while heat loss may outweigh solar gain, especially in the winter. Also, if the windows on the other elevations are too small to achieve reasonable internal light, occupants will resort to daytime use of artificial lighting, eroding the energy savings from passive solar energy.

- *Avoidance of overshadowing*: Buildings should be carefully spaced on site to avoid the overshadowing of southern elevations, particularly during winter when the sun is low. Taller building should be located to the north of the site, or to the south of road junctions or open space. Car parking and garages in particular can be suitably located in over-shadowed areas, particularly to the north of housing.

- *Building type*: Terraces, apartment/office blocks and, to a lesser extent semi-detached buildings can reduce heat loss as there are fewer exposed ‘external’ walls. Such house types can also be built at greater densities, representing a more efficient use of land.

- *Thermal buffers*: Using unheated spaces such as conservatories, garages and porches alongside heated rooms to act as thermal buffers can reduce heat loss.

- *Landscape and topography:* Positive use of the local landform and landscape features, particularly trees can allow best use of natural daylight, solar energy, wind sheltering as well as creating a development that responds to its context. Slopes will influence the spacing of buildings for solar access, with southerly slopes allowing greater solar access at smaller separations than a level site. Deciduous trees can be carefully placed to provide shade in the summer while allowing sunlight to pass through at a low angle in winter. Small scale tree and shrub planting can also provide privacy for ground floor south-facing living rooms.

3.9 *Combined Heat and Power (CHP)*

Conventional forms of power generation not only produce harmful greenhouse gases, they are also highly inefficient. The efficiency of power stations supplying energy distributed through the national grid can be as little as 22% at the point of use. Combined Heat and Power (CHP) is a much more fuel-efficient energy technology that recovers the heat that is a by-product of electricity generation and distributes it alongside electricity in the form of hot water for space heating. The energy generated is up to 90% efficient and CHP will typically reduce carbon dioxide emissions by 60%. CHP systems are located at the point of consumption meaning there is very little loss of energy through transmission and distribution and greater resilience to supply disruption as power is produced locally and independently of the grid. In many instances, any excess electricity generated by a CHP unit can be exported and sold to the grid thus shortening the capital cost payback period. CHP is possible at a variety of scales, including micro to serve individual buildings.

3.10 CHP plants can be adaptable to different fuels. Conventionally, natural gas is used which is a low carbon fossil fuel but renewable fuels such as biogas, biomass and hydrogen can also be used and offer a more sustainable alternative. Further efficiency savings can be made with the addition of an absorption chiller which allows the CHP system to provide cooling, potentially for air conditioning and refrigeration. The main markets for CHP tend to be those with high heat requirements, for example leisure centres, hospitals and industrial sites with process heating requirements, especially the chemical, brewing and paper industries. Sewage treatment works sometimes use CHP fuelled by biogas, emissions released during the decomposition of sewage.

3.11 The emerging market for domestic or micro CHP systems has significant potential to improve energy efficiency and reduce energy bill in homes, offices and other buildings where fitted in place of standard domestic boilers. Domestic systems have the potential to be up to 90% energy efficient, not only producing heat but also a proportion of electricity in the same process. Excess electricity produced, especially likely in the morning, even has the potential to be fed back into the grid.

4. Waste Recycling

In 1998/99 106 million tonnes of waste was produced in England and Wales each year by households, commerce and industry and the amount is rising. Municipal waste, which is collected by or on behalf of local authorities, has been increasing at around 3% per annum and if it continues to do so it will have doubled from the 1995 level by 2020. Around 54% of commercial and industrial waste and 83% of municipal waste – is buried in landfill sites, however this is becoming increasingly unsustainable for a number of reasons. First and foremost we cannot continue to rely on landfill because sites are rapidly reaching their capacity. There are three ‘live’ landfill sites in the Borough that accept waste but they cannot continue to do so forever and there are limited opportunities for identifying land suitable for new landfill sites. Transporting waste to other sites is expensive and has its own environmental implications. Landfill sites are also a major source of methane, which along with carbon dioxide is a major contributor to climate change. Methane is produced when biodegradable materials such as paper, food wastes and green wastes decompose in the absence of oxygen. In response to this and other factors greater emphasis is now being made upon reducing waste and substantially increasing re-use, recycling, composting and the recovery of energy from waste as part of a more sustainable approach to waste management.

4.1 In April 2005 the Borough Council enhanced its kerbside recycling and household refuse collection service, introducing an ‘alternate weekly’ collection system to increase the percentage of waste recycled in the Borough. Newspapers and magazines, plastic bottles, glass bottles and jars, cans and foil, cardboard and garden waste is all collected on a fortnightly cycle. To aid this service, households have been supplied with various different receptacles to segregate waste. In addition to this kerbside collection service there are a number of ‘bring’ recycling sites across the borough where recyclable waste can be deposited, including books, clothes and shoes and the Lower Burgh Household Waste Recycling Centre in Chorley, which offers comprehensive facilities for recycling green waste, wood, oil, batteries, plastics, rubble, soil, paints and cardboard. In addition, householders can dispose of asbestos sheeting, fridges and freezers, electrical goods, gas bottles and some chemicals. There are similar sites just outside the Borough at Station Road, Rufford and Flensburg Way, Farrington.

4.2 Home composting is another means of recycling and minimising household waste. Green waste from the garden including grass cuttings, twigs, leaves, hedge cuttings, plants, weeds and flowers and organic kitchen waste such as vegetable scraps – and even teabags! – can be turned into compost for use in the garden. The helps the environment by reducing the amount of rubbish thrown away and the number of car journeys to tips, reducing the need for chemical fertilisers and eliminating the need to use peat (peat bogs are home to some of our rarest plants and animals). If you regularly buy products to improve your garden composting can also therefore save you money. Home composting requires little technology – all you need is a suitable space and a compost bin or heap. Free compost bins are available to households in Chorley through Lancashire's Home Composting scheme, which is being coordinated by HDRA Consultants in partnership with Lancashire County Council and local district and unitary authorities (see Appendix 8.3 for more details)

4.3 *In order to promote and support recycling in the Borough, provision should be made in new developments for sufficient facilities and enough space for composting organic waste, and for the storage of materials that can be recycled. In addition, new development should be located where there is adequate accessibility to bring recycling sites.*

4.4 In addition to the waste produced by households, commerce and industry, over 70 million tonnes of waste is produced during the construction and adaptation of buildings and other engineering projects each year in England and Wales. The sustainable management of this waste considered below.

5. Materials

5.1 The use of materials for all uses has implications relating to both the energy needed in their production and their eventual disposal. This section refers specifically to the materials used in construction and redevelopment. These have a significant impact on the energy efficiency of buildings in terms of the amount of energy needed to create a comfortable internal environment. It is also important to consider the selection and sourcing of materials on the basis of the environmental impact of the materials themselves. Ten percent of the total energy consumed in England and Wales annually is from the manufacture and transport of building materials. In addition construction and demolition waste represents a significant proportion of total waste generation. Reclaiming, reusing and recycling materials – using more sustainable alternatives – can thus reduce much of the approximate 21 million tonnes of construction waste deposited as landfill annually in the UK and significantly reduce energy use. This applies to all development, from small household extensions to large housing developments, industrial units and offices etc.

5.2 When evaluating the use of materials with respect to environmental impact, consideration needs to be given to the whole process of obtaining the raw material: processing, delivery, construction and disposal. In the first instance, consideration should be given to the following:

5.3 *Use of salvaged building materials*: Consideration should be given to the use of recycled building materials, either from demolished buildings that once occupied the site, or from places nearby such as those acquired, for example, from second-hand building materials suppliers. The re-use of brick, stone, slate and timber will reduce the amount of waste produced by a development and the cost of new materials. The selection of materials should also be influenced by consideration of the possibility of future recycling, at the end of the useful life of the building. For this reason materials should be capable of separation for re-use. Lime mortars for example never set as hard as cement and one of the big advantages is that the mortar can be cleaned from the brick making it possible to be reused. In contrast cement mortars cannot be easily removed making bricks good for nothing more than hardcore. Locally sourced and reused materials can also reflect the local character and minimise the energy used in transportation. All materials should be selected in such a way that overall transport costs are minimised. This includes all aspects of transport, from the collection of raw material to delivery to the building site.

5.4 *Reuse of buildings*: The conservation of existing building materials can, where the building is sound, be extended to the reuse of a whole building, in preference to a rebuild solution. In such cases consideration should be given to the need to improve the energy efficiency of the building. Listed Building Consent may be required to improve the energy efficiency of Listed Buildings, particularly when fitting new windows. Please check with the Council's Development Control team.

5.5 *Low impact building materials*: Applicants should ensure as far as possible that where new building materials are required they are selected on the basis of a sustainable supply and on the basis of the least possible energy consumption being involved in their manufacture. 'Embodied energy' is the energy used in obtaining the raw materials and manufacturing a product. Materials with very high-embodied energy such as aluminium and plastic, particularly uPVC, require a high energy input in their manufacture and thus, where practicable, should be avoided. Brick production is an energy intensive industry and therefore it is often better to reuse old bricks wherever possible. Cement production is also an energy intensive process and as such cement should be used sparingly. Lime mortars are a viable alternative to using cement as they have been used for centuries.

5.6 Low impact materials include earth, straw, cork and hemp. Timber is also a relatively low impact product providing it forested sustainably. It has low levels of embodied energy and very high levels of economy in energy usage in the finished building – reducing carbon emissions via reduced energy consumption and increasing potential carbon absorption from the atmosphere in releasing land for new tree growth. Every cubic metre of wood used instead of other building materials saves almost one tonne of carbon dioxide from polluting the atmosphere. Timber should be sourced from certified sustainable sources, such as those accredited with the Forrest Stewardship Council (FSC) trademark. The growth of trees has the further advantage of locking up atmospheric carbon.

6. Water

6.1 Human disruption to the earth's natural water cycle – including the impact of climate change – has resulted in intensified periods of both drought and flooding in Britain as well as elsewhere. The treatment, purification and transport of water for domestic, commercial and industrial applications is also a major use of energy. The sustainable use of water is vital in contributing to the reduction of the impact and occurrence of both droughts and flooding and reducing energy use. A wide variety of measures can be included in new development to reduce water consumption and improve the efficiency with which water is used. *Applicants will be expected to provide evidence of how the following measures have been incorporated into new development, where appropriate*:

6.2 *Rainwater Harvesting*

Average annual rainfall in Chorley is over 1000 mm. Rather than allowing this rainwater to soak into the ground, evaporate or to enter the drainage system it can be captured from roofs and other impermeable surfaces and put to a variety of uses. Simple systems involve the use of a water butt to collect water for irrigating gardens. Indeed, rainwater can be better for plants than tap water because it is very rich in natural minerals that are removed by treatment processes. In more sophisticated systems, tanks have filters that remove all debris and particles from the water making it clean and suitable for most non-potable uses, including washing the car, flushing the toilet and running a washing machine. Toilet flushing accounts for about a third of water use in a typical UK household and the water used is unnecessarily treated to drinking water standard. Overall, the amount of water saved, cost and payback period for Rainwater Harvesting Systems is dependant on the size and type of system installed, amount of rainfall and cost of mains water but a typical domestic installation will provide nearly all non-potable household requirements, saving around 50% on mains water consumption and will have a payback period of between 10-15 years, although this can be as low as 2-5 years for larger commercial systems.

6.3 *Greywater Recycling*

Greywater is wastewater from showers, baths, washbasins, washing machines and kitchen sinks. Like rainwater this can be used for a number of non-potable uses, in particular watering the garden and landscaped areas and toilet flushing. Greywater requires filtration and chemical or biological treatment prior to reuse. Systems are most suited to multi-occupancy buildings as these are likely to have greater water circulation ensuring the greywater used is fresh rather than having had a long storage residence time in the system.

6.4 *Water saving devices*

In addition to the use of rainwater and greywater, there are a number of devices that aid water conservation in the home or workplace. These devices should be incorporated into the design of new developments but can also be integrated into existing buildings:

- *Low-flush and dual-flush toilets*: The volume of water used to flush the toilet represents a significant proportion of a buildings water use. Newer toilets have smaller cisterns and thus use less water. The capacity of cisterns can be further reduced with the use of cistern dams or water savers such as a 'hippo' or 'hog'. Dual flush toilets have two different flush volumes, for example a standard 6-litre flush and a reduced flush of 4 litres, or 4 and 2 litres in the more efficient toilets.

- *Waterless toilets and urinals*: Standard urinals use around 6-10 litres of water to flush. Waterless urinals – which use none – can thus offer substantial savings, particularly in buildings with high levels of occupancy, such as offices, schools and hotels. Waterless toilets have also been successfully installed in new and retrofit situations in a number of dwellings in the UK, albeit mainly those in rural areas not connected to a mains sewer. There are two basic types: a composting toilet and an incinerating toilet.

- *Low water use appliances*: Low water use domestic white goods e.g. washing machines and dishwashers should be specified as these can use significantly less water and energy, especially in comparison to older appliances.

- *Spray taps*: Low flow spray taps can save up to 80% of the water and energy used in comparison to standard pillar taps and are cost-effective and easy to fit. Sensor-operated taps further ensure minimal consumption of water per use. Showers (excluding power showers) generally use less than half the water needed to take a bath and aerated spay showerheads can also reduce water consumption.

- *Controlled intermittent supplies:* Using 'petrol-pump' types of supply can cut the amount of main water used for certain applications, particularly industrial processes such as cooling, cleaning or washing finished articles, workspaces or vehicles where normally a tap or hose would have been left running all the time.

- *Landscaping*: Consideration should be given to gardens and landscaping schemes which require little or no irrigation. Preference should be given to existing, native and/or droughtresistant plant types and water-retaining mulches. If watering is necessary, rainwater or recycled greywater should be used to water gardens rather the mains supply.

6.5 *Sustainable Drainage Systems (SuDS)*

Sustainable Drainage Systems seek to control surface water run-off – rainfall that is not absorbed by the ground or by trees and plants or evaporated. A variety of methods are used to decrease the amount of surface runoff, decrease the velocity of surface runoff or divert it for other purposes, thereby reducing the contribution it makes to sewer discharge and flooding. There are a number of elements that can combine to form a Sustainable Drainage System including soakaways; permeable and porous surfaces, e.g. paving; ponds, basins or swales for temporary storage during heavy rainfall (detention basins) or longer term storage (retention basins); channels to divert water from undesirable locations and structures that increase the lag between a rainfall event and discharge of water to the drainage system by increasing infiltration.

6.6 The SuDS approach is particularly suited to urban areas where high-density development and extensive impermeable surfaces mean surface runoff can easily cause flooding, either directly or indirectly through sewers becoming overloaded. They can also provide landscape, amenity and biodiversity benefits. It may be necessary to enter into agreement with the Council and United Utilities over maintenance and other matters where SuDS features are incorporated in new developments.

7. Renewable Energy

7.1 Whilst reducing energy demand is crucial, so is finding and expanding the use of more sustainable *sources* of energy. The Sustainable Resources Development Plan Document (DPD) will seek to encourage renewable energy generation in the Borough, through both 'standalone' projects and the integration of technologies within new and refurbished developments. Renewable energy – energy generated by flows that occur naturally and repeatedly in the environment, e.g. from the wind, the fall of water, from the sun and from biomass - is a vital component of sustainable resource use as it offers the potential to generate heat and power without any harmful emissions, such as carbon dioxide, or the depletion of natural resources.

7.2 The report 'Opportunities for Renewable Energy in Chorley' pulls together the findings of a Renewable Energy Study and identifies a number of renewable energy technologies that are possible in Chorley and provides advisory technical, financial and environmental 'criteria' for each technology. Building on this, key criteria relevant to all renewable energy schemes are set out in the Sustainable Resources DPD and will be used to assess planning applications. While encouragement is given to renewable energy schemes, these criteria seek to ensure any negative impacts of renewable energy development are satisfactorily addressed. In addition to these criteria, each technology has different characteristics, locational and technical requirements that raise specific issues that should be addressed in any planning application. Many of these criteria will have an impact on the viability of any proposal and will primarily be the concern of the developer when appraising potential sites. A series of maps produced as part of the Renewable Energy Study give broad locations where different technologies may be most suitable based on these criteria. These are attached as Appendix 8.1. This section is intended to provide more information on the various types of renewable energy, their requirements and impacts, including how these impacts will be assessed.

7.3 Micro/building-mounted technologies

Many of the technologies outlined below are applicable at a micro scale for integration into new and refurbished buildings or 'retro-fitted' to existing structures. Take up of these technologies will be necessary in Chorley to comply with the Sustainable Resources DPD, which will seek a percentage of the predicted energy requirements of new buildings to be provided on site by renewable energy sources. Micro and building-mounted technologies may not always require planning permission and will be welcomed where they meet the criteria set out in the Development Plan Document and below.

7.4 Wind energy

Wind power is a technically proven energy technology for which there is great potential in the UK yet it currently only accounts for 0.5% of the electricity generated in this country. Given this potential, a significant proportion of national and regional targets for increased electricity generation from renewable sources is likely to be met by onshore wind developments.

7.4.1 The use of wind as a renewable energy source involves harnessing of power contained in moving air by wind turbines. Wind turbines use aerodynamic forces ('lift' and 'drag') to produce mechanical power that can be converted into energy. Wind developments vary considerably in size, up to large grid connected turbines with rotors over 100m in diameter as well as turbines grouped in wind farms. In general terms, the larger the turbine (in terms of both height and rotor size) and the higher the average wind speed the greater the electricity generated. This is known as 'rated capacity' which is a measure of the maximum output of the electricity generator - generally achieved in wind speeds above 12-15 metres per second (m/s) at the hub (centre point) of the rotor. The largest wind turbines generate up to 3 megawatts (MW). Based on average UK household consumptions figures over the course of a year a turbine of this size would be expected to provide enough electricity to serve around 1680 homes. More commonly, wind developments have consisted of a number of smaller turbines such as at Coal Clough, near Burnley, which is the nearest wind farm to Chorley and was one of the first to be built in the UK in 1992. At Coal Clough twenty-four 400 kW turbines supply approximately 5400 homes but more recent developments have utilised turbines generating between 1 – 3 MW as technology has advanced.

7.4.2 Building-mounted micro turbines are an emerging technology and are likely to become more common in both rural and urban areas. They are available with either horizontal or vertical axes, the former having a diameter of less than less than 1.75 m. These systems have a rated capacity of around 1 kilowatt (kW) and can reduce domestic electricity bills by up to one third.

7.4.3 Criteria for assessing renewable energy projects are set out in the Development Plan Document. The following aspects will be specifically relevant to wind power applications and should be addressed in all submissions:

7.4.4 Landscape and Visual Impacts

Modern wind turbines are large structures, up to and over 100 metres tall. Along with associated infrastructure, including tracks, foundations, hard-standings and substations they will inevitably have an impact on the landscape and the visual environment. Even small building mounted turbines will have a visual impact in both urban and rural areas. All turbines should be carefully sited, where possible using the existing landform to limit impacts on sensitive views. The Lancashire County Council guidance on Landscape and Heritage contains the findings of a study of landscape sensitivity to wind energy development in Lancashire relating to the Landscape Character Areas identified in the County. The sensitivity of areas in Chorley to wind developments of 2 or more turbines rated at 1.3 MW or greater is shown in Map X, however each scheme will be assessed on a site-specific basis. Smaller scale developments, defined as single commercial-scale turbines, community and domestic turbines will be permitted provided there is no significant environmental determent to the area concerned.

7.4.5 Building-mounted turbines should, so far as practicable, be sited so as to minimise their effect on the external appearance of the building and streetscene, for example upon non-public frontages and below the highest part of the roof or chimney.

7.4.6 *Ecological impacts*

Developers should consult with English Nature and other relevant national, regional and local organisations regarding the presence and importance of species and habitats in and around proposed development sites and assess any potential impacts and mitigation measures. Ornithological concerns are of particular relevance and the design and layout of wind developments should take account of the risk of 'bird strike', loss of habitat and changes to the landscape.

7.4.7 *Noise*

Noise levels from modern turbines are generally low and, under most operating conditions, is unlikely to exceed background noise. Any increases in ambient noise levels, particularly around noise sensitive developments should be kept to acceptable levels in relation to existing background noise. In accordance with Planning Policy Statement (PPS) 22, the framework described by 'The Assessment and Rating of Noise from Wind Farms' (report by ETSU for the Department of Trade and Industry, 1997) should be used to assess the noise from wind energy developments. In summary, noise should be limited to 5 dB(A) above background and an absolute level within the range of 35 to 40 dB(A) in low noise environments during the day. These indicative noise levels offer a reasonable degree of protection to local residents without placing unreasonable restrictions on wind farm development. There is no evidence that low frequency noise (infrasound) from wind turbines is at a sufficient level to be harmful to human health.

7.4.8 *Shadow Flicker*

Under specific circumstances, the sun passing behind the rotors of a wind turbine will create a shadow. When the blades rotate, the shadow flicks on and off, an effect known as 'shadow flicker'. Problems caused by shadow flicker are rare as in the UK it only occurs inside buildings within 130 degrees of north relative to the turbine and where the flicker appears through a narrow window opening. The occurrence and duration of shadow flicker is also dependant on a number of other factors including the time of the year (relating to the height of the sun), time of day, the distance and height of the turbine and the prevailing conditions - shadow flicker mainly occurring in bright sunshine and cloudless skies. In practice, therefore, a single window in an building will only be affected, if at all, for a few minutes at certain times of the day during short periods of the year. Shadow flicker can be mitigated by siting wind turbines at sufficient distance from the residences likely to be affected – it has been demonstrated that flicker effects occur only within ten rotor diameters of a turbine. Applicants should provide an analysis to quantify the effect of shadow flicker upon any buildings within this distance of proposed wind turbines.

7.4.9 *In addition to the criteria set out in the Development Plan Document and further defined above, the following issues should also be considered:*

7.4.10 *Wind speed*

The energy produced by a wind turbine depends largely on the strength of the wind at the site of the turbine. Intermittency and variations in wind speed are also important. Map 1 shows there is an average wind speed of above 4 m/s across the whole of Chorley, with areas to the west, east and south averaging higher wind speeds. Micro turbines currently start generating electricity at 4 m/s thus there is the potential for them to be installed across the Borough. Larger turbines require higher average wind speeds of around 6.5 m/s (at 40 metres above ground level). It may be necessary to erect a temporary anemometer for a period of around 12 months in order to assess whether a particular site will be suitable in terms of wind speed. In such instances these same criteria will apply in determining any planning application.

7.4.11 *Site Access*

Amendments to existing road networks required to gain access to sites proposed for wind turbine developments, both during the initial construction and for subsequent maintenance, should be detailed in the planning application, along with any on-site tracks and assessed in terms of their impact on the landscape, local traffic and in terms of potentially providing easier access to the area. Where possible, land converted to access roads and tracks should be reinstated or the infrastructure scaled down.

7.4.12 *Electromagnetic Interference*

Wind turbines may interfere with electromagnetic signals effecting communication systems that use electromagnetic waves as the transmission medium, including television, radio and emergency services networks. OFCOM are able to provide details of all the microwave links that may be affected by a development and the applicant should come to an agreement with all relevant link operators prior to submitting a planning application.

7.4.13 *Cultural Heritage*

Wind turbines and ancillary infrastructure can have a significant impact on the setting of sites, buildings, monuments and historic landscapes and upon archaeological interests in both rural and urban areas. The Renewable Energy SPD and Landscape and Heritage Supplementary Planning Guidance produced by Lancashire County Council provide guidance on how this can be mitigated. Building mounted and small free-standing turbines have a strong contemporary design that is likely to contrast greatly with traditional buildings and streetscapes. Where they are to be incorporated into traditional forms and layouts great care will be needed to ensure that their siting does not cause detriment to the historic form. Design solutions should be sought that minimise the views of the turbine and avoid siting in prominent locations. The incorporation of micro-turbines into new housing development presents unique opportunities to the developer. Care should be taken to ensure they do not become the dominant form within the streetscape but instead add to the spatial and architectural interest of the development. Often micro wind turbines can be incorporated as a design feature to provide character for the development.

7.4.14 *Cumulative Impacts*

The level at which significant cumulative impacts occur is dependent on the scale and proximity of wind energy developments, the character and sensitivity of the landscape, the location and detailed design of the development. Each application will be assessed in it's own merits in light of baseline conditions at the time of the application. The potential for additional wind turbines cannot be taken in to consideration when determining a planning application.

7.5 Hydropower

Water flowing from a higher to a lower level can be channelled through a turbine to produce electricity. The amount of power produced is dependant on the volume of water and rate at which it flows. Canals, rivers and reservoirs in Chorley may all be suitable for small or micro scale hydroelectric schemes, generating up to 1MW for connection to the electricity grid or to supply power to single point users.

7.5.1 *Landscape and Visual Impacts*

Small-scale hydropower schemes consist of a number of built elements, including a small dam, barrage or weir, a turbine house containing the turbine, generator and ancillary equipment and a tailrace returning the water to the watercourse. Changes to the water regime, such as changes in water levels and flow and the creation of small reservoirs can also have potential visual impacts. All built development should be sensitively sited and designed so as to integrate into the landscape by careful use of landform, materials, vegetation and tree cover and, where appropriate, new planting where appropriate. In addition to new schemes, there are a number of old water mills in the Borough that could be adapted to generate electricity. Restoration should be sympathetic to the historic design and materials.

7.5.2 *Ecological impacts*

The risk of hydropower schemes to fisheries should be addressed and, where necessary, dams and weirs should include structures such as fish passes to protect fish, particularly migratory species, and other freshwater animals from the turbines. Risks of damage to aquatic life can also be mitigated by careful design and adjustment of the seasonal operating schedule of the plant. Developers should liase with the Environment Agency and English Nature to establish the required environmental information and the potential impacts that are to be considered.

7.5.3 <u>*Noise*</u>

The noise emitted from a hydroelectric turbine is likely to be contained by the turbine house and not heard more than a few metres away. Where residential properties are located in close proximity to a proposed scheme, noise limits may be imposed as a condition of granting planning permission.

7.5.4 *In addition to the criteria set out in the Development Plan Document and further defined above, the following issue should also be considered:*

7.5.5 <u>*Cultural Heritage*</u>

Hydropower is an important element of Chorley's industrial history, having been used to power factories and mills. Where waterpower features remain, their reinstatement and adaptation to provide modern small-scale hydropower can bring positive regeneration benefits. Where these opportunities exist, restoration schemes will be supported provided they are carried out in a sympathetic manner which respects the historic value of existing features. Where new facilities are proposed, an archaeological assessment and evaluation of the site may be likely at an early stage. Further advice in contained within the Lancashire County Council Landscape and Heritage SPG.

7.6 Landfill Gas

The natural processes of decay in biodegradable waste in landfill sites produces gas – in particular methane – which has historically been 'flared'. At larger landfill sites, however, sufficient quantities of gas are produced to make electricity production a viable alternative. There are two existing operation schemes in Chorley, at Ulnes Walton and Withnell, with a generating capacity of 3MW and 2MW respectively. A third scheme at the Rigby Houghton Landfill site in Adlington was permitted in October 2005. This will have an electricity generation capacity of 3MW. *Any future proposals utilising landfill gas welcomed. They will be assessed against the criteria set out in the Sustainable Resources Development Plan Document*. Landfill gas generation plants are unlikely to create any additional impacts further to those created by the landfill site itself; however, the following factors may be relevant where sites are located close to residential areas:

7.6.1 *Landscape and Visual Impacts*

Mitigation measures should be proposed where landfill gas plants would cause visual intrusion, particularly where extraction and landfill works have ended and the site is undergoing restoration.

7.6.2 *Local Amenity*

Applicants should demonstrate that proposed development would not cause undue harm to local residents, this relating to noise, odour and pollution.

7.7 Biomass

Biomass is a collective term for all plant and animal material. A number of different forms of biomass can be burned or digested (see anaerobic digestion, below) to produce heat (for space and water heating) and electricity. An increasing range of fuels, known as 'biofuels' are now being utilised with the most common being wood-based. These being either energy crops grown specifically for fuel such as willow and poplar grown on short rotation coppice and *miscanthus* grasses or arising as by-products of other activities. Providing the wood burned as fuel comes from sustainable sources the carbon dioxide released during combustion is balanced by that absorbed trees planted in its place. As biomass is produced from organic matter over a much shorter period of time than fossil fuels – which take millions of years to create – it is a carbon neutral process.

7.7.1 Wood is usually used as logs, wood chip or wood pellets - a compact form of wood, which has low moisture content and high energy density. At a domestic scale there are two main applications of biomass, stand-alone stoves and central heating boilers. Wood burning stoves are fuelled by logs or wood pellets and have become increasingly popular in households due to their aesthetic qualities. They also have significant benefits in providing space heating for rooms where they are located and provide an output of between 6-12 kW, achieving efficiencies of over 80%. There are also many domestic scale log, wood chip and wood pellet burning central heating boilers available. As with conventional boilers, these wood-fired systems provide hot water and central heating via radiators. Log boilers require manual loading but are less expensive than wood pellet, wood chip or dual-fire (pellets and chips) systems. In these more sophisticated systems the fuel can be automatically fed, making it easier to supply heat when it is required. Higher output wood burning stoves can also be fitted with an integral back boiler for the purpose of providing both hot water and central heating.

7.7.2 The cost of wood-fired stoves and boilers depends on the type and size of system but as a guide, stand alone room heaters cost £1500-£3000 installed and a typical 20 kW wood pellet boiler – the average size needed for a three bed semi-detached house – cost around £5000. This means wood heating has amongst the lowest capital costs of all the renewable energy technologies, being almost as cheap as mains gas, However, unlike other forms of renewable energy, biomass systems still require the purchase of fuel. In addition to homes, they can be used in many other sectors such as schools, offices and industrial premises.

7.7.3 On a larger scale wood and other biomass products can also be used for the production of electricity. The main method of producing electricity from wood is a combustion plant (where the material is burned to produce steam), although there are two other possibilities, namely, gasification (where the material is heated in such a way that gases are given off) and pyrolysis (where the wood is heated in the absence of oxygen to produce a bio-oil liquid with some charcoal and gas).

7.7.4 *Internal small-scale wood burning appliances do not require planning permission, however, in a Listed Building or Conservation Area you should check with the Council's Development Control Team before a flue is fitted as consent may be required. The installation of wood fuel appliances must also comply with all safety and building regulations. Applications for larger-scale biomass plants requiring planning permission will be assessed against the criteria set out in the Sustainable Resources Development Plan Document. The following specific issues should be considered:*

7.7.5 <u>Landscape and Visual Impacts</u>

Where biomass plants cannot be housed in existing buildings, new or adapted units should, where possible, be located close to existing buildings (excluding residential dwellings) and designed to fit into their surroundings. Due to their appearance and impacts on amenity discussed below larger plants should be located within existing industrial areas.

7.7.6 <u>Noise</u>

Engines, condensers and chippers may all create noise within biomass plants. This noise should not cause an unacceptable degree of disturbance on surround amenities and, where relevant, facilities should adhere to the British Standards for controlling noise pollution.

7.7.8 <u>Odour</u>

The impacts of odour from a proposed biomass plant and methods for controlling it must be detailed in the planning application in order that it does not unduly harm residential amenity.

7.7.9 *Pollution*

Developers must satisfy the relevant pollution control authority that potential emissions can be adequately regulated under the pollution control framework and that cumulative effects of existing sources of pollution in and around the site and the proposed development would make the development unacceptable.

7.7.10 *In addition to the criteria set out in the Development Plan Document and further defined above, the following issue should be considered:*

7.7.11 *Transport*

The environmental impact of transporting biofuels long distances to biomass generation plants can outweigh the positive benefits of such facilities, therefore, plants should be located in close proximity to a fuel source. Costs of delivery also significantly increase with distance. It is suggested that a 4 MW facility should be located within a 40 km wood fuel resource that is a minimum of 4,000 ha and/or 20,000 tonnes of forestry waste. In addition, biomass plants have the potential to be traffic intensive with delivery of fuel occurring regularly. Surrounding roads should have adequate existing capacity to serve the plant. The impact of traffic upon surrounding amenities should be assessed.

7.7.12 The growing of fuel for biomass plants, for example short rotation coppice, does not fall under the control of the planning system.

7.8 Anaerobic Digestion

In addition to the combustion of biomass material, organic wastes can be digested under anaerobic (oxygen-free) conditions by bacteria to produce a flammable gas consisting mainly of methane and carbon dioxide. This biogas can be used to generate electricity and/or hot water. Projects can be developed on a small-scale to suit individual facilities and wastes (for example, in farm or dairy situations), or on a much larger scale to take a variety of wastes as part of a Centralised Anaerobic Digestion (CAD) facility.

7.8.1 Planning Applications for anaerobic digestion plants will be assessed in accordance with the criteria set out in the Sustainable Resources Development Plan Document. Please refer to the above section for specific key issues.

7.9 Solar power

Light and heat from the sun can be utilised to generate energy in two ways. Photovoltaic (PV) systems covert solar radiation into electricity using semi-conductors within photovoltaic cells while Solar Water Heating (SWH) systems are designed to capture the heat of the sun and use it to directly heat water. Both systems are well suited to the urban environment as they are entirely silent and release no emissions.

7.9.1 Photovoltaics: Individual PV cells are most commonly interconnected to form solar modules or panels, mounted upon pitched roofs, however, modules can also be mounted on the side of buildings and on free standing support structures on the ground. PV can also be integrated into the roof or façade of buildings through, for example, the use of PV tiles, cladding and other solar building solutions which are often indistinguishable from conventional building materials. Solar panels are typically 0.5 – 1m² in size with a peak output of 70 to 160 watts. Typical domestic installations comprise of an 'array' of connected panels covering 10-15m². A system this size will produce up to 2 kW peak output, which in the UK would be expected to produce 1500 kWh - enough to provide approximately one third of the average family's annual supply. Where PV systems are grid-connected, surplus electricity not consumed within the building can be exported to the local distribution network with many suppliers buying the 'exported' electricity. A typical 2 MW peak capacity PV scheme would cost between £12,000 and £15,000.

7.9.2 Solar Water Heating: Employing similar technology to PV systems, radiation from the sun in collected by 'asborbers' within either flat plate or evacuated tube collectors and transferred as heat to a fluid – most obviously cold water. The climate in the North West is suitable for Solar Water Heating systems as year-round sun is not required. Modern systems will make a significant contribution to water heating requirements, providing 50 - 60% of annual domestic hot water requirements and can also be used to provide space heating.

7.9.3 Planning permission is not always required when installing solar panels to existing buildings, particularly where roof-mounted panels do not exceed the ridge height or extend beyond the plane of any roof slope. This, however, may not apply within Conservation Areas and upon Listed Buildings where planning permission and/or listed building consent may be required. *Please check whether you require planning permission or consents for your proposal with the Development Control Team*. This should be done at the earliest stage possible, however we will need to know certain details of the system you are proposing. *The following issues should be considered where solar panels are proposed and will be relevant in addition to the criteria set out in the Sustainable Resources Development Plan Document where consent is required:*

7.9.4 *Siting issues*

Solar panels are best positioned facing due south at an angle of between 20-40 degrees, however, PV and SWH systems can function at an inclination of between 10 and 60 degrees and within 90 degrees of due south. Shadows from buildings, trees and other structures should be avoided as these can significantly reduce the performance of solar panels.

7.9.5 *Cultural Heritage*

Permission for solar panels in Conservation Areas, on a Listed Building or another building or structure within the curtilage of a Listed Building will only be granted where the character, appearance and special architectural or historical interest of the area or building are preserved.

7.10 Ground Source Heat Pumps (GSHP or GHP)

Ground Source Heat Pumps transfer this heat from the ground into a building to provide space heating. It can also be used to pre-heat domestic water. Heat is drawn from the ground using 'ground loop' – a closed circuit of piping buried in the ground in either a borehole or horizontal trench and heat pump. The technology is relatively well established as heat pumps are already used in fridges and air conditioning units. For every unit of electricity used to pump the heat, 3-4 units of heat are produced. Can be designed to meet 100% of space heating requirements but it will usually only pre-heat domestic hot water so top up heating (e.g. an immersion heater) will be required.

7.10.1 There are few planning issues associated with ground source heat pumps as they are unlikely to be visually intrusive and often the main components are located under ground or within buildings. *Planning Applications will be assessed using the criteria set out in the Development Plan Document. Where excavations for horizontal trenches for ground loops involve sizable areas of land, consideration of landscape and visual and ecological impacts will be relevant. Disruption of sensitive habitats such as species-rich grasslands should be avoided and all sites sensitively restored.*

7.10.2 *In addition to the criteria set out in the Development Plan Document, consideration should be given to possible archaeological interests in the land and also to local hydrology. Any detrimental impacts should be mitigated.*

8. Appendices

8.1 Maps

From Renewable Energy Study

8.2 Glossary

This section to be developed

8.3 Further information

This section to be developed

Section 3 – Energy Use

- The Lancashire Energy Efficiency Advice Centre (LEEAC) provides impartial advice on simple, practical steps householders can take to improve the energy efficiency of their homes. Telephone 0800 512 012.
- Energy Saving Trust

Section 4 – Materials

Section 5 – Recycling

- More details about household waste collection and recycling in Chorley can be found by telephoning the Recycling helpline on: 01257 515355 or e-mailing waste.management@chorley.gov.uk.
- Free home composters can be ordered by telephoning 0845 6588550 or visiting www.compost-it.org.uk. There is also a home composting advice line: 0845 0500110.
- A real nappy laundry service operates in the Chorley area, phone 01782 816902 for details.

Section 6 – Water

Section 7 – Renewable Energy

- CLAREN – Cumbria and Lancashire Renewable Energy Network

  Address: Town Hall, Duke Street, Barrow-in-Furness, Cumbria, LA14 2LD

  Website: www.claren.org.uk

  Telephone: 0845 6018874

- Renewables Northwest

  Address: 5th Floor, Fourways House, 57 Hilton Street, Manchester, M1 2EJ

  Website: www.renewablesnorthwest.co.uk

  Telephone: 0161 236 7481