West-East link main will benefit the entire Integrated zone with increased security of supply

Security of supply to be mproved through the planned duplicate main for the Wirral

Frodsham and Helsby connected to regional network (via Dee Large Diameter Trunk Main)

UU: Ellesmere Port trunk main will add flexibility around Sutton Hall wtw (at concept stage)

UU: no significant supply constraints for current demand

Sutton Hall wtw (UU)

Ellesmere Port

Northwich

DVW: Future phases of the large commercial development in the Old Warren area (Flintshire) will need additional supply infrastructure (booster station and service reservoir) to use water from the Chester WRZ. Detailed development plans will help DVW plan its supply scheme

Boughton wtw (DVW)

Chester

Winsford

Hawardine Industrial Estate (high water demand customers) also supplied by Boughton

Huntington wtw (UU)

Boughton treatment works has recently been refurbished and DVW considers it has capacity to meet future demand. Capacity could be increased in the future.

Chester Business Park: supplied by Llwyn treatment works (can be supplied by Boughton in an emergency)

DVW: no known or forecast supply/treatment constraints in the study area

Oswestry wtw (UU)

Key:

- CWaC area
- Buffer zone
- Council wards

Water Company Supply Areas

- DVW Wrexham zone
- DVW Chester zone
- UU Integrated zone
- Water treatment works
- Indicative supply source areas
- Preferred development areas

UU = United Utilities
DVW = Dee Valley Water
wtw = Water treatment works (for supply)

0 2.5 5 10 15 20
Kilometers

Scale: 1:323,500 @ A3

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Cheshire West and Chester Water Cycle Study

Figure 6.2
Water supply constraints

May 2010
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6.3.4 Wastewater Treatment and Sewerage Capacity

The Council's growth projection was provided to United Utilities and to Dŵr Cymru Welsh Water to enable the companies to undertake a high level assessment of the impact of development on wastewater treatment works within the study area. The two companies preferred to use different approaches to the analysis, as described below.

For Dŵr Cymru Welsh Water, GIS analysis was undertaken to apportion growth to wastewater treatment works catchments. Where specific development sites have been proposed these were mapped to the treatment catchment in which they are located. In each ward there is also an annual figure of unallocated developments. At this time it is not possible to allocate these to specific treatment works, unless it is known that only one treatment works serves the ward. Where it was not possible to assign growth to one works, growth was either distributed based on existing distribution of housing, or shared equally.

To account for uncertainty in growth trajectories, an upper and lower growth scenario was assessed, representing the central growth estimate +15% and -15% respectively. To convert housing development to a growth in population, the household occupancy projections in Dee Valley Water's WRMP were used. This assumes that population will increase in direct response to housing growth. This is likely to be over simplistic but there is no information on which to base an alternative assumption. Occupancy rates (and thus population) in existing households is forecast to fall over the period 2010 to 2026. The population growth from new development is therefore expressed as a net population increase by each works. This resulted in the growth totals shown in Table 6.7 being assigned to each WwTW.

Table 6.7 Estimated Population Growth, Dŵr Cymru Welsh Water WwTW

WwTW Catchment	Housing Growth (2010-2026)	Estimated population growth (2010-2026)			Net population increase 2010-26*
		Lower	Central	Upper	
Chester	5,378	9,967	11,725	13,484	5%
Malpas	156	289	340	391	16%
Tattenhall	301	276	325	373	15%
Neston	150	556	654	753	-1.5%

*Based on central growth forecast

The results of the assessment are presented in Table 6.8. Development in the Chester, Malpas and Tattenhall areas are not expected to be constrained by wastewater treatment works capacity. Neston WwTW is close to capacity, and whilst planned growth in the area served by this treatment works is relatively small, further detailed modelling is required to investigate whether infrastructure improvements are required. Flow from the works is approaching

the dry weather flow consent limit and additional development may result in flows exceeding the consented limit prior to 2015. Consultation with Dŵr Cymru Welsh Water has confirmed that more detailed investigation should be undertaken, since decreases in household size within existing dwellings may result in capacity being sufficient (as indicated by the net reduction in population shown in Table 6.7 above).

Table 6.8 Dŵr Cymru Welsh Water Assessment of Impact of Potential Growth

WwTW	Comment
Chester	Chester WwTW has capacity to treat additional flows within the scenarios. There are no schemes planned for Chester WwTW in AMP5 (prior to 2015).
Malpas	WwTW has a quality driven improvement scheme planned scheduled for completion in 2015 (new inlet works and phosphorus removal). The design of this scheme will take account of known approved growth. Recent performance of this works has been within consent limits and development prior to delivery of improvement works in 2015 is not expected to put compliance at risk.
Tattenhall	WwTW has a quality driven improvement scheme planned for completion in 2014 (phosphorus removal). The design of this scheme will take account of known approved growth. Recent performance of this works has been within consent limits and development prior to delivery of improvement works in 2015 is not expected to put compliance at risk.
Neston	Flow from works is approaching DWF consent condition and there is a risk that new development could cause DWF to exceed consent. Analysis indicates that this could occur within AMP5 (i.e. prior to 2015). However, growth levels in forecast are low compared to the catchment size, consequently decreasing household size in existing dwellings may offset growth from new developments. Detailed modelling assessment is required to determine whether this will constrain growth in the catchment.
	Development ok, no constraints identified
	Development may be ok, minor constraints identified, minor mitigation required to meet planned trajectory

Dŵr Cymru Welsh Water has not identified any network capacity issues associated with development at this stage. However, detailed modelling would be required when further information about the timing and location of development is known

An alternative approach to assess the impact of growth on wastewater treatment was agreed with United Utilities. GIS plans of the growth sites were provided to the company and a qualitative assessment of the potential impacts of growth was provided. Although a development site may lie within the catchment of a WwTW it does not necessarily follow that it will be served by that treatment works and flows may be redirected if required. The qualitative assessment provided by United Utilities considers this.

The qualitative assessment provided by United Utilities is presented in Table 6.9. The comments provided by the company consider both the hydraulic capacity of the works and the capability of the works to treat effluent within consent conditions. In undertaking this assessment, United Utilities has grouped the development sites into the 'development areas' listed, which are identified as draining to the wastewater treatment works identified in Table 6.9.

Table 6.9 United Utilities Assessment of Impact of Potential Growth

Development Area	Receiving WwTW	Comment
Ellesmere Port	Ellesmere Port	An in-depth assessment indicated that there is sufficient headroom AMP 5 (to 2015). Detailed modelling assessment would be required to assess impacts of growth in AMP6 and beyond (i.e. post 2015). Land is available to expand the WwTW if required.
Elton and Frodsham	Helsby	Capacity probably available within the existing WwTW until 2015 based on the proposed growth figures provided by the Council for this study. Population and DWF increases are small. Consequence of development considered low in AMP5 (prior to 2015). Detailed modelling assessment would be required to assess impacts of growth in AMP6 and beyond (i.e. post 2015). Land is available to expand the WwTW if required.
	Kingswood	Southern site in the Frodsham area would drain to Kingswood WwTW. However, there is no easy provision to service this site due to site lying outside existing WwTW catchment, and infrastructure would be required to connect site to existing wastewater network. There is an existing private WwTW on site but the company do not consider that this is suitable for adoption by United Utilities.
Northwich	Northwich	Northwich WwTW was extensively rebuilt in 2010 to increase hydraulic capacity and to improve effluent quality. Capacity is therefore likely to be available within existing WwTW but this would need to be confirmed with detailed modelling. The company has identified that there may be capacity issues in some existing networks and pumping stations to convey flow to Northwich WwTW.
Tarvin	Tarvin	Sufficient growth to trigger investment not anticipated during AMP5 (prior to 2015). Detailed assessment is required to confirm whether there is sufficient capacity in AMP6 and beyond (post 2015). Land is available to expand the WwTW if required.
	Mickle Trafford pumping station for treatment at Ellesmere Port	An in-depth assessment indicated that there is sufficient headroom AMP 5 (to 2015). Detailed assessment is required to confirm whether there is sufficient capacity in AMP6 and beyond (post 2015).
Delamere	Oakmere	WwTW currently at hydraulic capacity and not capable of receiving additional flow. There is additional land on site to enable expansion but United Utilities would not want to expand site. Detailed assessment would be required to assess alternative options for wastewater from development in the area.
Winsford	Winsford	United Utilities consider that although significant population growth is forecast for this works, the impact will be largely offset by a gradual reduction in flows from a trader. Hence there is available headroom at the works. Detailed modelling assessment would be required to assess impacts of growth in AMP6 and beyond (i.e. post 2015). Land is available to expand the WwTW if required.
Allostock	Pump to existing local network for treatment at Holmes Chapel WwTW	Development in this area is located in close proximity to small pumping station. Modifications to network pumping stations may be necessary to divert flow to Holmes Chapel WwTW (located outside the study area). Capacity available at Holmes Chapel WwTW due to trade effluent reductions, therefore no expansion of works would be required.
Burwardsley	No existing United Utilities facilities available	Development in this area is located outside existing WwTW catchments and a new treatment facility would be required. .
Tarporley	Tarporley	Small developments proposed in AMP5 can be accommodated. Developments proposed in AMP6 and beyond will require increased capacity. Land available for extensions.
Sandiway	Cuddington	There is an existing privately owned WwTW that is sized for treating trade effluent. This is not considered suitable for adoption by United Utilities. The alternative for development in this area is to treat effluent at Cuddington WwTW. This works has very limited capacity and may require increased capacity to serve development. Land available to extend works.
		Development may be ok, minor constraints identified, minor mitigation required to meet planned trajectory

Development Area	Receiving WwTW	Comment
		Constraints identified, development may be ok with major mitigation to meet growth targets against Core Strategy timescale

Without further information, it is difficult to draw firm conclusions as to the extent to which wastewater infrastructure could constrain growth in part of the study area served by United Utilities. Based on the qualitative assessment presented in Table 6.9 it is possible to draw the broad conclusion that wastewater infrastructure may be a constraint to growth within the study area, particularly in the period post 2015, and that detailed modelling assessment of capacity of wastewater infrastructure to treat wastewater is required.

In the period prior to 2015, wastewater treatment capacity is not expected to constrain growth at most locations. United Utilities has identified that Oakmere WwTW (serving the Delamere area) is currently at hydraulic capacity and that it would not allow any further connections to this WwTW. Land is available at the site for expansion of the works, but the company would prefer not to develop this site further. Development in the Burwardsley area is outside the current United Utilities wastewater catchments. Development in this area would require construction of a new WwTW or an alternative non-mains sewerage solution such as septic tanks. At Tarporley and Cuddington, the WwTW are identified at being at or near capacity and further investment will be required to increase capacity at the works. At both locations, the company states that sufficient land is available to extend the treatment works. United Utilities have identified the following WwTW as having sufficient capacity in the period to 2015:

- Ellesmere Port;
- Helsby;
- Tarvin; and
- Winsford.

The company has identified that the capacity of these WwTW to accept additional growth beyond 2015 would need to be monitored and reassessed. Development in the short term (prior to 2015) will not be constrained by wastewater infrastructure. At all four sites space is available to expand the works if required.

Discussions with the company have identified that further investigation is recommended once site allocations are developed for the Northwich area. Development located around Wincham would be towards the edge of the catchment for Northwich WwTW where the capacity of the sewerage system tends to be lower. Consequently, significant development towards the edge of the catchment may require enhancements to the network to convey wastewater to the treatment works. Other potential constraints relating to the network have been identified at the site located to the south of Frodsham (which would drain to Kingswood WwTW), which would require network enhancements to connect it to the existing WwTW catchment, and the development sites to the east of the study area which would be routed to Holmes Chapel WwTW.

In summary, wastewater treatment capacity may be a constraint to growth within the study area. Detailed modelling of the impact of development in respect of WwTW capacity would need to be undertaken to confirm whether additional investment to increase capacity is required. Both United Utilities and Dŵr Cymru Welsh Water emphasised that they would require all future development to be serviced with separate foul and surface water drainage, with only foul water being discharged to public sewers draining to wastewater treatment works.

6.4 Sustainable Drainage

Surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account. This should be demonstrated as part of the flood risk assessment and considered at all stages of the planning process. Developer contributions towards flood protection, strategic Sustainable Urban Drainage facilities, land drainage, and flood mitigation etc. may be required for some developments. This will also be dealt with on a case by case basis.

The type of land on which development is to be located dictates the amount of runoff that is permitted from development, and how it must be managed. With regards to developments on brownfield, or developed sites, PPS25 considers that developers should reduce runoff rates by 'as much as is reasonably practicable' (see paragraph 5.54 of PPS25). The water company and/or the Environment Agency may specify a set reduction below existing levels, such as a percentage reduction (20% below existing), or back to greenfield levels. This is a key mechanism for alleviating any existing over-capacity drainage networks. For greenfield, or undeveloped sites, the runoff rate after development must not be greater than the runoff rate from the undeveloped site.

CWaC should ensure that their development policies reiterate the requirements of PPS25 paragraph 5.54 to ensure that development on greenfield does not increase runoff rates and flood risk, and that as far as possible developments on brownfield contribute to reducing runoff levels and flood risk. All potential development sites will fall into either the greenfield or brownfield categories and the appropriate guidance should be used to guide the management of runoff from these sites. Where a development site contains areas of both greenfield and brownfield land, care should be taken to ensure a pro-rata approach is taken. Figure 8.1 in this WCS report provides a more detailed outline of the requirements for the design of drainage systems for new developments.

The implementation of SuDS will contribute to reducing the rate and volume of rainfall run-off from urbanised areas. Appropriately designed, constructed and maintained SuDS are more sustainable than conventional drainage methods because they can mitigate many of the adverse effects of urban stormwater runoff on the environment. They achieve this through:

- reducing runoff rates;
- reducing the additional runoff volumes that tend to be increased as a result of urbanisation;
- encouraging natural groundwater recharge;

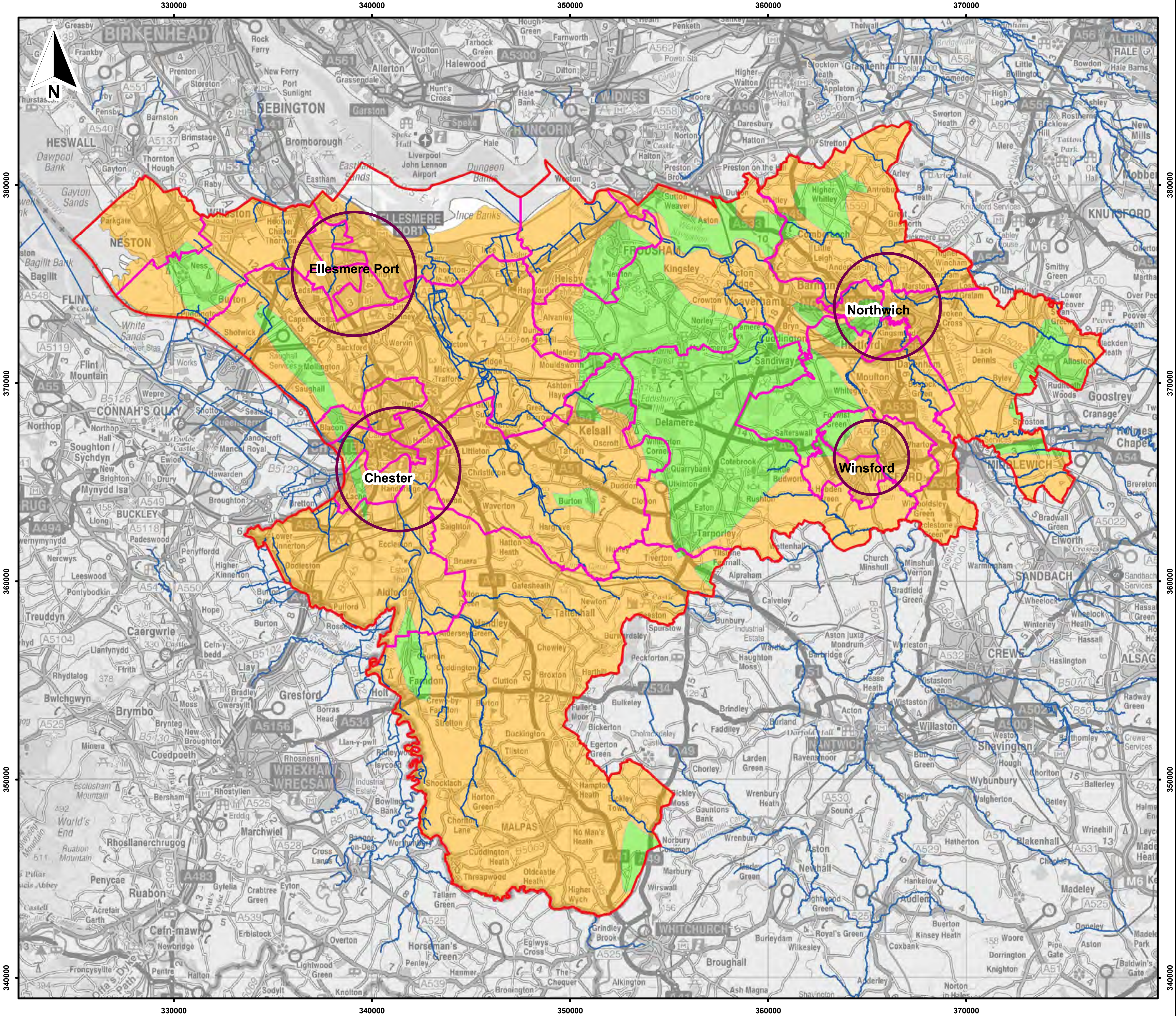
- reducing pollution concentrations in stormwater;
- reducing the volume of surface water runoff discharging to combined sewer systems;
- contributing to enhanced amenity and aesthetic value of developed areas; and
- providing opportunities for habitat and biodiversity enhancement.

Developments should implement SuDS in preference to traditional drainage systems to contribute to the overall flood risk management in the study area. Examples of SuDS techniques are presented in **Error! Reference source not found.**, whilst an overview of the potential locations for infiltration based SuDS within the study area is presented in Figure 6.3. Site specific assessments for SuDs need to consider Groundwater SPZs. These are areas defined by the Environment Agency to protect groundwater sources (wells, boreholes and springs) used for public water supply and are shown in Figure 4.15. The Environment Agency uses these zones to establish pollution prevention measures and monitor the activities of potential polluters nearby. The Environment Agency website incudes a facility to enable the user to check the location of SPZs by postcode[19].

Table 6.10 Examples of SuDS Techniques

SuDS technique	Description	Attenuation / Infiltration
Soakaways	Trenches infilled with coarse material with voids that store and dispose of water through infiltration	Infiltration
Permeable Paving	Paving that will permit rainwater to infiltrate into the soil or constructed layers beneath the surface	Both
Infiltration Basins	Depressions that store and dispose of water through infiltration when required during heavy rainfall events. During dry periods the basins remain dry	Both
Infiltration Trench	Vegetated strips of gently sloping ground that allow infiltration through the base and sides, as well as filtering out silt and pollutants.	Both
Filter Strips	Vegetated strips of gently sloping ground to drain water from impermeable surfaces and filter out pollutants, silt and suspended sediments.	Both
Swales	Shallow vegetated channels that conduct and/or retain water, and allow filtering of particulates through the vegetation. If unlined these features allow infiltration into the underlying ground.	Attenuation
Ponds	Permanently wet basins designed to store water and attenuate peak flows, with permanent bankside and emergent vegetation	Attenuation
Detention Basin	Dry basins designed to attenuate peak flows and store water for specific retention times	Attenuation
Wetlands	Shallow pond systems with aquatic vegetation that allow water to be stored and passed through vegetation for filtration of pollutants	Attenuation
Green Roofs	Vegetated roofs that reduce runoff volumes and rates	Attenuation

[19] www.environment-agency.gov.uk/homeandleisure/37833.aspx



Key:

CWaC study area

Council wards

Rivers

Suitability for Infiltration

Most Suitable

Less Suitable

Preferred development areas

Suitability for infiltration is based on BGS geology mapping. Areas where sandstone/conglomerate solid geology or sand/gravel drift geology are present at the surface have been classified as "Most Suitable". Areas where there are surface deposits of clay or alluvium have been classified as "Less Suitable".

However, this classification is based on large scale mapping, and dependent on local conditions there may be opportunities for infiltration based SuDS elsewhere in the study area. Site-specific porosity tests should be carried out to confirm ground suitability. In addition to attenuation storage, some degree of infiltration may still be possible for SuDS in areas where infiltration rates are limited.

Historic ground contamination, or the presence of Groundwater Source Protection Zones should be verified during the SuDS design stage.

Based upon DiGMapGB-625 map data (solid and superficial), with the permission of the British Geological Survey.

0 1.25 2.5 5 7.5 10

Kilometers

Scale: 1:215,000 @ A3

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Cheshire West and Chester
Water Cycle Study

Figure 6.3 Potential Ground Suitability for Infiltration based SuDS

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The Flood and Water Management Act (FWMA) was passed by parliament in April 2010. The final version implements the key recommendations made in Sir Michael Pitt's independent review into the summer 2007 floods and will transpose the requirements of the Flood Directive into law in England and Wales. The act requires that Local Planning Authorities at the county or Unitary level become responsible for managing local flood risk, including surface water flooding. In England SuDS are promoted as the preferred drainage option by national planning policy PPS25: *Development and flood risk* (CLG, 2006).

The FWMA 2010 sets out the process for ensuring that suitably designed SuDS are included within new developments. The act outlines the LPAs key role, as the 'approving body' in assessing that SuDS proposals are suitable and ensuring that SuDS are constructed as designed. Developers should include appropriate basic assessment and identification of SuDS requirements at the outline planning permission stage. Historic ground contamination, or the presence of SPZs should be investigated and verified during the SuDS design stage. In areas where combined surface water and sewerage drainage systems are under pressure there is also a role for using surface water separation (retrofitting SuDS) to reduce the risk of sewer flooding. This could offset the impact of additional loads from new developments. Retrofitting is likely to be much more expensive and disruptive but the local authorities can have a key role in helping to identify sites where this may be feasible.

Planning applications without any provision for the sustainable management of surface water should be passed back to the developer for further consideration. For the detailed planning permission stage, the local planning authority has two routes available to ensure that the SuDs are properly implemented and maintained. These are:

- By a condition of planning permission; and
- Through an agreement under S106.

The S106 approach requires financial contributions in the form of a bond or a periodic payment. This route requires negotiations and preparatory legal work in advance of the development taking place, but offers more security as it may only be varied by agreement. The FWMA 2010 states that an approving body may require this type of payment in support of SuDS implementation. The FWMA 2010 also sets out how, in general the LPA, as the approving body, will be responsible for adopting SuDS situated within public open space. Alternative arrangements will be required to provide for the maintenance of SuDS within private grounds (i.e. factory compounds).

It is essential that the ownership and responsibility for maintenance of every SuDS element is clear; the scope for dispute kept to a minimum; and durable, long-term accountable arrangements made. Where the surface water system is provided solely to serve any particular development, the construction and ongoing maintenance costs should be fully funded by the developer. S106 agreements may be appropriate to secure this. Authorities may wish to consider entering into an agreement under S106 to ensure the developer carries out the necessary works and that future maintenance commitments are met. They may also apply planning conditions which would require completion of the necessary works before the rest of the development can proceed. Information on funding streams is presented in section 6.6.

SuDS should be considered as providing an important contribution to biodiversity and green infrastructure provision. As the adopting (and assessing) authority for a large number of SuDS under the FWMA, CWaC should require all new SuDS to be constructed to high green infrastructure standards (as per CIRIA report C697 "The SuDS Manual"), with open-air features such as swales and basins or ponds being favoured, based on their greater potential for contributing to local biodiversity. Open-air systems are also more easily maintained than closed underground storage tank and pipe systems, helping to ensure that the systems function correctly into the future. Although

Figure 8.1 provides outline guidance, the provision of tailored SuDS guidance similar to the guidance[20] recently produced by Cambridge City Council (December 2009) will assist with achieving these objectives.

6.5 Potential Impact of Capacity on Designated Sites

In this chapter the constraints posed by each element of the water cycle have been presented and discussed. However, those constraints will not only affect the success of the growth plans, if growth goes ahead with insufficient services, this poses a significant threat to the designated sites in the area (see section 4.4). Table 6.11 lists the main sites that may be at risk from development with a brief description of the risk.

Table 6.11 Designated Sites Potentially at Risk from Growth in the Study Area

Sites at Risk	Description of Risk	Source of Risk
Mersey Estuary	Wastewater discharges from works on the River Gowy and Hornsmill Brook, and River Weaver flowing into the Mersey estuary. Likely significant effects on water quality within the SPA/Ramsar site as a consequence of sewage treatment effluent discharges and hard surface water runoff.*	Discharges from wastewater treatment works serving Ellesmere Port and Northwich. Discharge consents are derived to protect the receiving waters but failures from treatment works can occur** Development pathways in Central Ellesmere Port *
Dee Estuary	Wastewater discharges from works on the River Dee.	Discharges from wastewater treatment works serving Chester and nearby areas (Chester, Queensferry, Connah's Quay, Flint, Neston, and Heswall WwTW). Discharge consents are derived to protect the receiving waters but failures from treatment works can occur** Development pathways in Chester and also from Ellesmere Port
River Dee and Bala Lake	Abstraction for public water supply from the River Dee. Affect on flows within the river and into the estuary. Increased abstraction reducing dilution downstream of wastewater treatment works. Likely significant effects on water flows and sediment patterns within River Dee site as a consequence of increased water abstraction and modification of water flows.*	Abstraction from the River Dee (unspecified locations). At present approximately 75Ml/d is abstracted for supplies within the Chester and Wrexham water resource zones. Development pathways in Chester and also from Ellesmere Port
Oak Mere SAC	Wastewater discharges	Oakmere treatment works. Discharge consents are derived to protect the receiving waters but failures from treatment works can occur**

[20] Cambridge City Council SuDS design Guidance: http://www.cambridge.gov.uk/ccm/content/planning-and-building-control/urban-design/sustainable-drainage-systems.en

Sites at Risk	Description of Risk	Source of Risk
Water dependent Ramsar, SAC, and SSSI sites, e.g. Midland Meres and Mosses, and West Midland Mosses	Abstraction for public water supply from surface water and groundwater. No identified risk from wastewater treatment.	Various locations, unspecified at present.

*Source: EPNBC Habitats Regulations Assessment

**In such cases the responsible water company will be prosecuted

Habitats are increasingly at risk due to development pressures seeking to change land use. Development on previously 'open land', including brownfield, may fragment local habitats. It is recommended that planners require development proposals which recognise the character and sensitivity of the local environment and which include environmental features that will mitigate the effects of development.

Habitats are also at risk due to climate change. Section 5 presents the detail on current climate change analyses and what this means in terms of rainfall patterns and volumes. The consequences of this are likely to include increased flooding, particularly during the winter months, although summer flash flooding could also become more of a problem (see section 4.2 and 6.2.3). Increased storminess leads to fluvial river flooding and drainage flooding. Where drainage and sewerage systems are combined this can lead to spills from Combined Sewer Overflows, i.e. untreated water discharging into rivers and streams. Excessive and regular flooding is not just disastrous to people but it can severely damage vulnerable habitats. In-stream ecology and riverbank (riparian) habitats are sensitive to inundation and scouring that can occur during flood events. If these events become more frequent, habitats will be less able to recover. Flood risk management, adherence to PPS25, and development of sustainable drainage systems are all essential to adapt to our future climate and protect our environment.

Climate change is also likely to result in reduced rainfall during the summer. Hotter, drier summers will lead to increased demand for water, although the level of increase is still very uncertain. Increased demand will coincide with reduced availability of water to abstract for public water supplies. The water companies are forecasting significant losses in their supply base over the next 25 years due to climate change. Section 4.3.4 describes how reduced rainfall will result in less water within the rivers and streams into which we currently discharge treated wastewater. Section 4.5 discusses how demand for water is forecast to increase due to climate change, and how this would drive the need for further water abstraction whilst at the same time, yields available to the water companies are forecast to decline. If left unchecked, the effect of reduced river levels and ongoing water abstraction could cause serious environmental damage as sensitive aquatic habitats run dry.

The Environment Agency regulates water abstraction in line with environmental conditions (river flow levels, reservoir levels, groundwater levels) in order to protect habitats and the wider environment. In drought situations water companies are given permission through drought permits and drought orders to abstract more than normally

permitted. This can lead to direct conflict between environmental needs and public water supply, and in the short term environmental damage can occur. Climate change may increase the risk of these events occurring more frequently. In the longer term, this is not acceptable and the water companies are developing water resource management strategies to avoid the need for water restrictions or drought permits. It is already the case in the South East of England where water resources are seriously stressed, that water companies are seeking to develop significant resource-side schemes such as new reservoirs and desalination, combined with extensive water demand management strategies.

6.5.1 Opportunities to enhance environmental networks

It is recommended at this stage that development in West Cheshire identifies opportunities to enhance designated sites, sustain and improve wetland bird populations, and reduce habitat fragmentation and improve site connectivity. This can be achieved through Green Infrastructure planning and the creation of 'blue corridors'.

Urban master planning may consider the opportunities to support strategies such as the Defra 'Strategy for England's Trees, Woods and Forests' , and the Forestry Commissions' Delivery plan to protect and increase sustainable resources, the natural environment , and to improve the quality of life for local communities.

There are opportunities for development sites to support the wider green infrastructure objectives of the North West. Sites that retain or create features such as ponds, open green spaces, street trees or woodland, can form an important link within the wider environmental network, preventing fragmentation of habitats, and in turn contributing to a higher quality of life for local people. There may be other opportunities to link to existing local environmental projects, for example using equipment and resources to restore a section of river habitat, at the same time as SuDS are installed in a nearby development site. Further information on green infrastructure specific to the North West is available online at 'Green Infrastructure North West' (http://www.greeninfrastructurenw.co.uk).

The Council may wish to explore these opportunities in more detail on a site by site basis, to identify the existing green infrastructure across the study area. In order to realize these objectives the Council will need to address the links between development and environmental networks/quality within its planning policies and develop detailed development briefs/action plans for developers.

6.6 Sources of funding for water infrastructure

Delivering the necessary supporting water infrastructure is critical to facilitating the envisaged residential and commercial growth of the study area. Communities require access to water, drainage, flood defences and green infrastructure. Whilst the specific cost of the required water and sewerage infrastructure will be investigated further by the water companies, the funding mechanisms and their policy implications need to be considered further by the Council and are outlined below.

[21] http://www.defra.gov.uk/rural/forestry/strategy.htm
[22] http://www.forestry.gov.uk/forestry/INFD-7DYC7Z

Table 6.12 summarises the most likely types of infrastructure projects that will be required to support growth in the area and their traditional funding streams. Following this, more detail is provided on the funding options available for the Council to explore.

Table 6.12 Funding Streams for Infrastructure

Infrastructure Type	Traditional Funding
Water supply – customer supply pipes	All new developments require individual supply pipes and the water companies have a statutory duty under the Water Industry Act 1991 (article 45 section 1) to connect to mains any building that has domestic water use, or where part of the building has a domestic use.
Increase sewerage and supply capacity in line with growth forecasts within the water company growth forecasts.	The required budget for strategic improvements is provided by the water company to Ofwat within their Business Plan. Once approved the funding is generated through customer bills.
Additional increase in sewerage and/or supply capacity identified locally, due to specific development projects (housing/commercial).	If the planned and budgeted infrastructure is insufficient to meet actual needs the water company has the option to apply to Ofwat for further funding to meet this demand. This would be an interim application, outside the AMP process, and not guaranteed. Alternatively, the water company may seek funding from the developer. This could be either through a requisition process, under the Water Industry Act 1991, or depending on the size of the development, there could be potential for financial support from the Growth Point funding[23]. The Council would later be repaid by developers when individual developments connect to the network. This option would secure the design and installation of the infrastructure in sufficient time ahead of development. The wastewater assets could then be adopted by the water company at a later date, or an inset appointment[24] could be considered to encourage the developer to embrace sustainable water management principles.
Sustainable Drainage Systems (SuDS)	Adoption of SuDS can be a difficult process, as the sewerage undertakers can't adopt them under current legislation. Failure to maintain SuDS to the required level could potentially lead to flooding issues. For local authorities to adopt, a funding mechanism is required usually through commuted sums from developers. A Maintenance Plan is usually required under section 106 of the Town and Country Planning Act 1990. It is recommended that further investigation is undertaken into procedures for SuDS adoption.

Funding may be available from a combination of Central Government, Local Government and Private Sector partners, including substantial contributions from Central Government. Consideration should be given to pooling contributions towards the cost of facilities, development tariffs and local delivery vehicles. To help achieve this:

[23] This is dependent on the future availability of Growth Point funding.

[24] An inset agreement (or arrangement) could be made, without direct involvement of the water companies. This could be set up, for example, for part (or all) of a particular development, whereby private wastewater treatment facilities are commissioned by the developers to treat wastewater from the site and obtain a discharge consent from the Environment Agency. Another alternative would be for the developer to be responsible for the foul drainage with a commercial arrangement with the water company to receive wastewater flows to an existing WwTW catchment.

- Infrastructure agencies and providers should align their investment programmes to help deliver the Council's proposals;

- Local Development Documents should identify the necessary additional infrastructure and services required to serve the area and the development they propose together with the means and timing of their provision related to the timing of development;

- Contributions from developers may also be sought to help deliver necessary infrastructure. To provide clarity for landowners and prospective developers, the Council should include policies and prepare clear guidance in their Local Development Documents, in conjunction with other key agencies, on the role of development contributions towards infrastructure.

6.6.1 Community Infrastructure Fund

The Planning and Reform Bill (2008) seeks the establishment of the Community Infrastructure Levy (CIL) which will give local authorities the ability to charge developers to help fund new infrastructure provision. The CIL regulations came into force on 6 April 2010. Councils and developers must now be sure that infrastructure obligations are necessary to make the development acceptable, directly related to the project and reasonably related in scale. Planning permissions granted on the basis of obligations outside this definition will be unlawful.

The levy should be based on a costed assessment of the specific infrastructure requirements of each development project, taking account of land values and potential uplifts. Levy charges may vary from area to area and according to the nature of development proposed. The levy should not be used to remedy pre-existing deficiencies in infrastructure provision, unless these have been, or will in time be, aggravated by new development. Where appropriate the local planning authority can use a CIL to supplement a negotiated agreement, which may be required for site specific matters, including affordable housing.

If the levy raised on particular sites is too large (given all the different infrastructure requirements) there is a risk that it could make development of those sites unviable, and therefore preventing some land from coming forward for development. For example, the value uplift when planning permission is granted may be smaller on certain brownfield sites, in particular those that require substantial remediation.

CIL payments could be collected for the delivery of water infrastructure and for maintenance arrangements of SuDs for example, however, if the Council seeks to use CIL for collecting contributions, analysis of all infrastructure requirements and costs will be required to ensure that an appropriate level of contributions is sought.

Further work would be required to investigate the cost of required infrastructure, to inform a potential Cheshire West and Chester CIL. However, it is possible that instead of the CIL, the new UK Government will progress a different charging system called the Single Unified Local Tariff (SULT)[25] to provide the funding for supporting infrastructure. SULT differs from CIL in that it will be at graded rates according to the size of the development

[25] Page 11: http://www.conservatives.com/~/media/Files/Green%20Papers/planning-green-paper.ashx (accessed 07-06-2010)

(CIL rates would be more variable for different developments as various factors are included in calculating the rate). SULT rates will be published by local authorities to give developers and upfront indication of the required infrastructure contributions.

6.7 Planning Obligations/Section 106

Planning obligations are typically undertakings by developers or agreements negotiated between a local planning authority and a developer in the context of granting planning consent. These are underpinned legally by section 106 of the Town and Country Planning Act 1990, and are also known as section 106 (s106) agreements. Government policy is that, in the context of planning consent, planning obligations should be used to make development acceptable in planning terms. This could be by securing contributions towards the provision of infrastructure and facilities required by local and national planning policies.

The scope of such agreements is laid out in the government's Circular 05/2005. Matters agreed as part of a s106 must be:

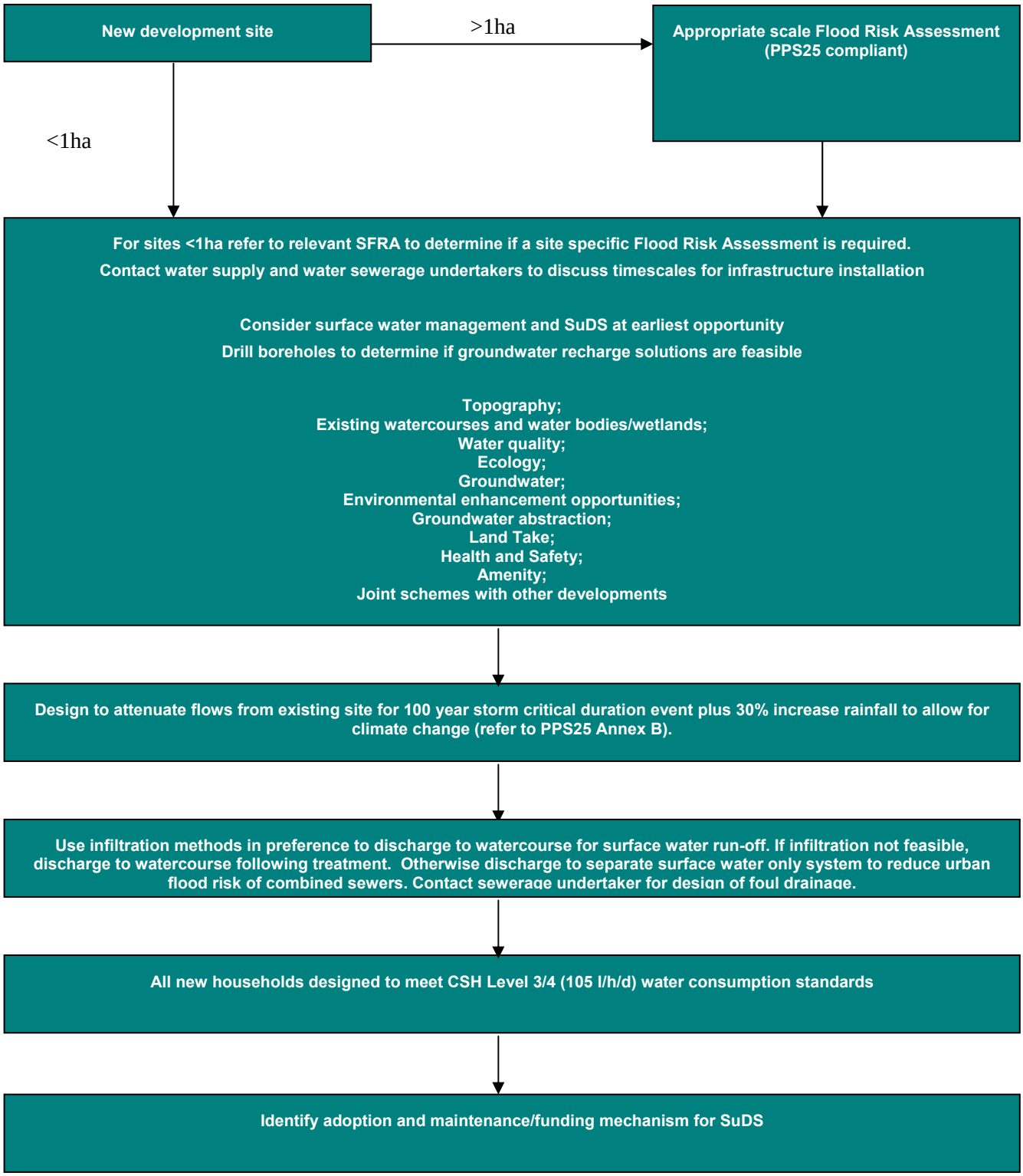
- Relevant to planning;
- Necessary to make the proposed development acceptable in planning terms;
- Directly related to the proposed development;
- Fairly and reasonably related in scale and kind to the proposed development;
- Reasonable in all other respects.

In particular a contribution to the cost of a piece of infrastructure can only be sought if it is necessary to make a development acceptable in planning terms and has a direct relationship to a particular development. A contribution can only be justified on water infrastructure where there is no legal requirement for the statutory undertaker to provide the specific infrastructure. However, if there is a development site that is precluded from coming forward for development due to a lack of water infrastructure and there are no commitments from the water company within their five year Asset Management Plans to deliver the required infrastructure, the developer could offer to provide the required infrastructure, through a unilateral agreement with the Council, to ensure that the development can come forward.

6.8 Checklist for developers

The checklist presented in Figure 6.4 has been developed for use by individual developers for planning applications and development design.

Figure 6.4 Checklist for developers



7. Strategy for West Cheshire

This section draws together the results from the constraints analysis to examine the best opportunities for delivering housing growth that make best use of existing infrastructure, and allow for the delivery of new infrastructure where this has been shown to be needed. It presents the overriding issues focusing on each of the four main growth areas, plus the rest of the study area, and then proposes a timescale for delivery, across the whole study area that best aligns with the projections supplied by the Council. The strategy does not only require consideration of the phasing and location of development, it also includes recommendations for the Council, specific actions that can be taken forward to ensure that the growth in the area is successful. These actions are presented in Chapter 8.

7.1 Chester

All the proposed developments in Chester, that have been allocated a particular site, are outside of the flood zones mapped in the SFRA, and represent infill, rather than extensions beyond the current Chester boundary. The SFRA states that "existing built up areas in Chester are protected to 1:200 year event. This level of protection needs to be maintained". Infill development in this area will benefit from this existing protection. The SFRA goes on to state that "any future development along the Sealand Basin embankments should be set back by at least 300m" and the significant flood hazards around Clifton Drive and flood storage basin around Finchett's Gutter.

When finalising the site allocations for the currently unallocated element (locations not yet determined) of the growth proposals, the Council needs to consider these constraints. This is particularly important for the unallocated growth in the Blacon, City, and Overleigh wards, but also in the Upton, Hoole and Newton, and Boughton Heath and Vicars Cross wards.

Growth in Chester is not constrained by either water resource availability or local supply infrastructure. Some lead in time may be required for Dee Valley Water to prepare connections infrastructure but no major enhancements are anticipated. There may be an opportunity for development in Chester to benefit from a scheme currently planned to increase supply to a commercial site near Wrexham. The Council should liaise with Dee Valley Water to explore this further. Demand is an issue though, and all new developments should be built adopting water efficiency measures, aiming to reach CSH level 3/4.

The groundwater SPZs map (Figure 4.15) shows that most of the proposed site allocated developments in Chester do not lie within SPZs. However, sites in Saltney, are within protection zone 3 and approximately 1 mile from protection zone 1. This is not a major constraint, but development needs to consider appropriate mitigation measures to prevent any contaminants entering the groundwater (e.g. lining subterranean storage facilities, installing filter drains, petrol interceptors, and installing a series of drainage elements such as filter drains, swales, and reed beds. See section 6.2.2).

All housing growth in Chester will be served by the Chester wastewater treatment works, operated by Dŵr Cymru Welsh Water. This is a very large treatment works which has considerable capacity to absorb extra demand (in terms of volume) from new developments. Whilst the capacity of the treatment works is not a constraint, the Council should be aware of the implications of short term construction, and longer term land use patterns in development areas along the River Dee, on surface water runoff and hence water quality. This will contribute towards the objective of achieving good ecological status in the tidal River Dee by 2027.

The Council should liaise with the Environment Agency to explore any opportunities that development may provide to contribute to the actions in the Middle Dee catchment (Dee RBMP) and to ensure that the developments it approves are not contrary to the actions that are proposed. The range of development sites that are either planned or still being considered across the Chester area provides significant opportunities to enhance environmental networks and contribute to green infrastructure objectives.

7.2 Ellesmere Port

The proposed site allocated developments in Ellesmere Port are not within the flood risk sites identified in the Ellesmere Port SFRA. The land at Ellesmere Port Docks is adjacent to the Manchester Ship Canal and there is the inherent risk of flooding if the canal structure fails. A total of 3,700 new homes are proposed in this area, 200 between 2010 and 2015. The canal does not pose a constraint but the SFRA recommended one risk assessment for all the developments, rather than many different developers completing a separate assessment. Therefore, a comprehensive Dockside developments flood risk assessment is required before the first of the housing developments are given planning permission.

Stanlow is protected by a flood alleviation scheme but other sources of flooding still pose a risk to the site; however, the area should be acceptable for less vulnerable development types. According to the data on proposed site allocated developments, there are no plans to build new homes in the Stanlow area.

There is no housing development proposed in the Ince Marshes and this should continue as the site is at risk of flooding from a number of sources, and the area has a natural tendency to flood. This natural tendency is considered important and future management plans are to allow this to take place. From an environmental perspective, it is not advisable for any of the non allocated sites in the Central and Westminster ward (20 per year) to be built in this industrial area, due to the residual flood risks.

SPZs are not a constraint to development in this area. The lack of groundwater protection required in this area supports the suggestion in the SFRA that residual flood risk at Stanlow may be reduced by developing natural attenuation on the Gowy Meadows.

Water quality in the area is of Poor ecological status, largely due to the current and historical industrial activity in the area. However, the aim is to raise this to good ecological quality by 2027, and so as well as water discharges, land use in the area will be a key concern for the Environment Agency and the River Basin Management Plan stakeholders. Drainage will be a key concern to these stakeholders and will most likely require evidence that

surface water in new developments will not jeopardise water quality objectives. The Council should liaise with the Environment Agency to explore any opportunities that development may provide to contribute to the actions in the Weaver Gowy catchment (North West RBMP) and to ensure that the developments it approves are not contrary to the actions that are proposed.

Growth in Ellesmere Port does need to consider the constraints presented by wastewater treatment. The Ellesmere Port and Helsby WwTWs are forecast to have capacity to meet existing and proposed demand until 2015 at which point capacity could be exceeded. United Utilities has indicated that it will be able to increase the capacity at these works but that it needs to undertake detailed modelling to determine what expansion is actually required. If development in Ellesmere Port is a priority, then it is important that the Council develops its plans in this area and liaises with United Utilities to ensure the Company has adequate time to model the impacts, and develop its wastewater treatment works assets sustainably.

Growth in Ellesmere Port is not significantly constrained by water resource availability. There are a large number of developments proposed in this area and so local supply infrastructure enhancements may be needed and this will need to be planned with United Utilities well in advance. Some lead in time may be required for United Utilities to prepare connections infrastructure but no major enhancements are anticipated at this stage.

Sustainable drainage systems may provide part of the solution in terms of the wastewater treatment, water quality, and drainage constraints. SuDS techniques should be selected on a site by site basis, considering the local requirements but should also consider the potential positive impact over a wider area. As mentioned, natural attenuation in the Gowy Meadows could relieve flood risk at Stanlow. SuDS in the form of reed beds can also provide on-site wastewater treatment. This has been done at Winchcombe in Gloucestershire. However, this option raises technical and health and safety issues. They also require large areas of land, compared with a conventional or packaged sewage treatment works.

The range of development sites that are either planned or still being considered across the Ellesmere Port area provides significant opportunities to enhance environmental networks and contribution to green infrastructure objectives.

7.3 Northwich

Flood risk is a serious problem in Northwich and much of the proposed allocated development sites lie within flood risk zones 2 and 3, and within a 1 in 100 year flood area. The SFRA concluded that less vulnerable development should be located in these areas with more vulnerable development further back from the rivers Dane and Weaver.

Central Northwich is also at high risk of flooding and the area has been subject to detailed Area Flood Risk Assessments (AFRAs) and ongoing negotiation with the Environment Agency. Most of the development here is planned to take place between 2015 and 2020. Measures for upstream flood storage and flood defence in the town have already been explored. The onus will now be on developers to demonstrate through planning applications how the flood risk can be mitigated through site specific designs.

In total, 2200 new homes are proposed in the area east of Winnington Avenue (predominantly after 2015). This area is not within identified flood zones and so is less constrained. Sites to the east of Northwich are also unconstrained by flood risk. The majority of this growth is planned between 2015 and 2025.

The proposed site allocations for Northwich indicate that all the new housing developments will be served by the existing Northwich WwTW and United Utilities has reported that this there is sufficient capacity at this treatment works to serve projected demands as it was rebuilt extensively in 2010. Only a small amount of unallocated, annual growth is proposed in the Weaver and Eddisbury catchments, and it is possible that sewerage from developments here would be directed to and treated at Cuddington WwTW. However, this works currently has a very small spare capacity. United Utilities has indicated that it will not adopt an existing trade effluent treatment works located in close proximity to one development site. Cuddington WwTW may require expansion to serve this site.

United Utilities advises that there are capacity issues in the existing network which would serve the proposed development in the Wincham area and that investment in network capacity is required. It is therefore recommended that the Council prioritises further development of its plans for this area and liaises closely with United Utilities to allow the Company to investigate its existing infrastructure, model projected demands, and develop an implementation plan to ensure existing and new developments are supported by a robust sewerage service.

Growth in Northwich is not constrained by either water resource availability or local supply infrastructure. Some lead in time may be required for United Utilities to prepare connections infrastructure but no major enhancements are anticipated. Demand is an issue though, and all new developments should be built adopting water efficiency measures, aiming to reach CSH level 3/4. SPZs are not a constraint to development in this area.

Sewerage services need to be examined across Northwich and plans for improvements developed. Sewerage problems may be more likely to occur in the short term if this is not addressed and so the Council may wish to focus on working with United Utilities to resolve this in the near future.

Data within the North West RBMP lists water quality in the river receiving discharges from Northwich WwTW as Poor, with the aim of reaching good ecological status by 2027. However, ammonia levels and the quality of invertebrates in the water are listed as “bad” (ammonia is a supplementary element which does not override the WFD classification). This is not a direct constraint to growth but the Council should liaise with the Environment Agency to explore any opportunities that development may provide to contribute to the actions in the Weaver Gowy catchment (North West RBMP) and to ensure that the developments it approves are not contrary to the actions that are proposed.

The range of development sites that are either planned or still being considered across the Northwich area provides significant opportunities to enhance environmental networks and contribution to green infrastructure objectives.

7.4 Winsford

The SFRA concluded that higher levels of flood risk are found in north Winsford, near the extensive potential future housing allocations and that consideration should be given to putting less vulnerable developments closer to the river and residential further back. The proposed site allocated developments include 50 new houses adjacent to the river to be built between 2010 and 2015. Subsequently, another 60 houses are planned adjacent to the river, and a small distance away from the river. If the driver for this is enhanced quality of development, due to a riverside location, there may be little point in suggesting relocating these development sites. The risk of flooding is serious and so development plans here should include mitigation measures to protect people and property.

United Utilities recognises that growth in Winsford could generate significant demand for wastewater services from an increased population. However, the Company considers that the impact will be largely offset by a gradual reduction in flows from a specific trader, and so forecasts available headroom (capacity) at the works, at least until 2015. The majority of growth in Winsford is projected between 2015 and 2020 and United Utilities has stated that detailed modelling is needed to assess the impacts of growth beyond 2015. As with Northwich, it is therefore important that the Council develops its plans (or scenarios) and liaises with United Utilities to ensure sufficient time to undertake its modelling and develop its asset implementation plan. Land is available to expand the Winsford WwTW if required.

Water quality in the River Weaver at the Winsford WwTW is of Moderate ecological status, with the aim of reaching good status by 2027. This is not a direct constraint to growth but the Council should liaise with the Environment Agency to explore any opportunities that development may provide to contribute to the actions in the Weaver Gowy catchment (North West RBMP) and to ensure that the developments it approves are not contrary to the actions that are proposed.

Growth in Winsford is not constrained by either water resource availability or local supply infrastructure. Some lead in time may be required for United Utilities to prepare connections infrastructure but no major enhancements are anticipated. Demand is an issue though, and all new developments should be built adopting water efficiency measures, aiming to reach CSH level 3/4. SPZs are not a constraint to development in this area.

The range of development sites that are either planned or still being considered across the Winsford area provides significant opportunities to enhance environmental networks and contribution to green infrastructure objectives.

7.5 Rest of Study Area

Outside of the four main growth areas, the Council growth proposals are for approximately 600 new homes between 2010 and 2015, 700 new homes between 2015 and 2020, and over 300 new homes after 2020. Most of this is proposed to be concentrated in the larger villages with an allowance for small scale development spread through settlements across the Borough. A review of the flood risks over this area shows that most of these sites are not within an identified flood risk zone. However, one exception is any development between Elton and Helsby, as this is close to a flood risk 3 zone. This means that development proposals may need an additional flood

risk assessment to ensure that the development does not extend into a flood risk zone, or increase the shape of the flood risk zone through its presence. This area is within the green belt and so development here will be extremely limited.

Growth in the more rural parts of the study may be constrained by connectivity to treatment works. Development in or around Neston is likely to be constrained by the capacity at Neston WwTWs. Dŵr Cymru Welsh Water has confirmed that this works is already close to its discharge consent, and options to increase the consent may be limited as it discharges into the Dee Estuary which is an important designated site. However, only 12 homes are included in the proposed site allocations. If this number is to be increased then it is highly recommended that the Council liaise with Dŵr Cymru Welsh Water regarding provision of wastewater treatment. Alternative treatment works that could treat extra demand in this area are Heswall or Ellesmere Port, but both would require considerable pumping to cover the distance.

Elsewhere, the small amount of growth near the Oakmere WwTW will contribute to the existing problems of hydraulic capacity. United Utilities has confirmed that there is no capacity at this treatment works to meet demand for any extra growth. The Council needs to discuss its proposals for a small amount of additional housing between 2015 and 2020 to determine how much of a problem this is, and whether there is sufficient time to resolve it. There are no realistic alternative treatment works in the area, due to the long distances.

Burwardsley is a rural ward and development here would be dispersed (barn conversions, etc). The potential development in the trajectory investigated in this study reflects recent development levels. New houses in this area are likely to be served by private facilities, such as septic tanks, as Burwardsley area is not within an existing treatment works catchment. United Utilities anticipates that additional enhancements would be required at Tarporley treatment works from 2015 onwards to meet potential demand in that area.

Unlike the developments in the main towns, the smaller developments distributed across the area, are more likely to come into contact with the SPZs . Growth in Neston is again highlighted as a potential issue, together with the proposed growth in Hooton as it these sites are in close proximity to protection zones 1. Similarly, development near Hapsford is close to a protection zone 1. Some development in Eddisbury is within a protection zone 3. These are not major constraints to housing development but would require consideration to prevent the risk of contamination, particularly during construction. Development of more hazardous building types, e.g. petrol stations in these areas is not recommended.

As with the rest of the study area, water resources and supply infrastructure are not expected to constrain growth. It may be advisable to give extra notice to the water companies of development in rural areas in case connections to the existing supply network require a slightly longer lead in time, for instance if new trunk mains are required. However, the water supply companies have seen the map of the proposed developments and both have confirmed that they expect no major issues. Demand is an issue though, and all new developments should be built adopting water efficiency measures, aiming to reach CSH level 3/4.

8. Recommended Actions

This section sets out the main recommendations based on the results of the water cycle study. It suggests policies that could be included in Development Plan Documents. This text is for information and is not prescriptive. The Council may use this information to develop its own policies as it requires.

Recommendation 1: Collaborative working

The water cycle study opens up communications between the Council and the water utility providers. The review of constraints and potential solutions has shown that in order to develop and implement housing and infrastructure plans these communications need to continue and extend to include adjacent Councils. The water companies need to be kept informed of revisions to all the housing development plans when developing their asset management plans. Once the water companies' investment plans have been finalised and assets are planned/approved the Councils need to consider any further revisions to their housing strategies within this context. Ongoing communication and liaison with these organisations is essential.

Collaborative working has been successful elsewhere, for example collaboration between the Environment Agency, the East of England Development Agency, and Anglian Water has led to a suite of guidelines for planners and developers[26]. These guidelines are applicable to planners across the country. They set out what policies for sustainable development should contain. The guidelines focus on water efficient buildings but can be applied to other sustainability elements. The guidelines say that LDF policies should:

- Refer to a nationally agreed sustainable building standard such as the CSH for households, or BREEAM standards for non-domestic buildings. This presents standards against which development can be monitored;
- Include a stepped approach to allow the standards to be implemented progressively over time;
- Reflect the content of local sustainability strategies and the evidence base within the water cycle study to prioritise water efficiency and flood mitigation measures in new developments; and
- Policies should refer developers to available guidance, set out monitoring systems and enforcement, and refer to the feasibility of options (i.e. extra costs are only relevant to achieving the very highest standards of sustainability).

[26] Water Efficient Buildings. Water and planning: guidance for planners (http://www.water-efficient-buildings.org.uk)

8.1 Flood risk and drainage

The report has shown how flood risk varies across the study area, how this might be exacerbated in the future due to climate change, and how modern sustainable drainage techniques can be employed to help mitigate the risks. An SFRA has been completed for the study area, and AFRAs have been completed for Winsford and Northwich.

Recommendation 2: Single flood risk assessment for Ellesmere Port docks

It is recommended that a single flood risk assessment is undertaken to consider all the proposed developments around the Ellesmere Port Docks. This should be undertaken before the first developments commence.

Recommendation 3: Include requirement for SuDS in new developments

It is recommended that the Development Plan Documents include policies that promote sustainable drainage techniques (SuDS) in all new developments, as opposed to traditional piped systems. Sustainable drainage will support the WFD objective to improve ecological status across the entire study area. Encouraging the use of SuDS through local planning policy will provide a robust basis for establishing more sustainable drainage patterns and incorporation of green infrastructure.

Local policies should consider the future maintenance of SuDS at the planning stage, particularly for larger housing developments. The Council should develop a clear policy regarding its position on adopting SuDS once developments have been completed.

It is recommended that the flow chart shown in Figure 8.1 is used to guide the drainage design standards of future developments. This chart details the key design considerations, reference documents and requirements for consultation during the development of SuDS. Planning and technical advice for SuDS is available online. The National SuDS Working Group has produced the Interim Code of Practice for Sustainable Drainage Systems, which is available as a free download from the CIRIA website[27]. The website also provides a range of resources explaining and promoting SuDS.

Table 8.1 provides details of example development site drainage design and flood risk investigation route maps, and indicative timescales for assessment and implementation.

[27] http://www.ciria.com/suds/

Table 8.1 Development Site Drainage Design and Flood Risk Investigation Route Maps

Site Description	Surface Water Management Requirements - Route Map
Standard Greenfield/brownfield site. No existing drainage/flood risk constraints identified, development should therefore manage its runoff to ensure flood risk is not increased to others downstream.	SuDS required by PPS25 as part of site development, these will manage surface water and ensure no increase in runoff occurs. Surface water should be managed following the Building Regulations Part H hierarchy (infiltration, discharge to watercourse, and a last resort discharge to a sewer). SuDS can be programmed to occur within the development timeframe. Follow guidance as set out in Figure 8.1.
Complex Multiple brownfield sites, drainage to either critical watercourse or combined/surface sewers known to have capacity issues. Properties downstream affected by flooding from ordinary watercourse that receives runoff from site. Development opportunity constrained by existing flood risk issues, plus the development needs to manage its runoff to ensure flood risk is not increased to others downstream.	Strategic investigation required (i.e. SWMP) with relevant stakeholders engaged and joint working. Investigation timeframe in the order of one year. Around two years for strategic SuDS detailed design and construction. Other SuDS works can be programmed within development timeframe (guidance in Table 8.1). Potential funding sources include: Defra SWMP funding, regional development agency, and future developer contributions.

Figure 8.1 Development site drainage guidance flow chart

Potential Development Site

Greenfield

Maintain runoff at greenfield levels.

Confirm with Environment Agency whether volumes of runoff should be managed as well as runoff rates (PPS25 para 5.54).

Brownfield

Confirm runoff attenuation requirements with the Environment Agency. No increase in runoff. PPS25 states that developers should "reduce runoff rates as much as is reasonably practical" (para 5.54).

Building Regulations Section H: specifies a hierarchy to manage surface water by (in preference order): 1) Infiltration (soakaways), 2) attenuated discharge to a watercourse, 3) discharge to a public surface water sewer.

Type of SuDS: confirm suitability for SuDS - WCS Figure 6.3, and potentially undertake site-specific porosity tests. Does the site overlie a Groundwater Source Protection Zone? Is there contaminated ground present on site, where pollutants could be mobilised by increased infiltration? If yes to either discuss further with the Environment Agency.

Is infiltration possible?

Yes - Design for infiltration based SuDS

No -Design for attenuation based SuDS

SUDS Design

- Guidance on SuDS – 'C697 The SuDS Manual' (CIRIA, 2007; see: http://www.ciria.org/SERVICE/search_bookshop/core/orders/product.aspx?prodid=155) provides the key guidance - levels of treatment required, SuDS management chain, types of SuDS, source, site and regional control of runoff.
- Calculate runoff rates (see: http://www.ciria.org.uk/suds/pdf/preliminary_rainfall_runoff_mgt_for_development.pdf for guidance).
- Sizing of SuDS storage, as required by PPS25 - 100 year + an allowance for increase in rainfall intensity due to climate change (Allowances in PPS25 Table B.2: 20% 2055 to 2085 and 30% 2085 to 2115). Residential development design lifespan considered to be 100 years, commercial/industrial to be 60 years.
- Allow sufficient space for required SuDS infrastructure on the site. Ensure site is designed so that excess flows are routed to amenity/car parks rather than properties. More natural/open-air SuDS have a range of additional benefits including water quality improvements, ecological, aesthetics and lower construction costs. The SuDs Wales website (http://www.sudswales.com) provides further details. The Environment Agency typically requests that the choice of SuDS maximises the benefits delivered unless there are notable constraints. Open systems such as swales and basins are typical easier to maintain over the longer term.
- Drainage system design – 'Sewers for Adoption' (WRc, 2006; see: http://sfa.wrcplc.co.uk/)
  - 1 in 2 year - pipe full
  - 1 in 30 year no site flooding (as specified in PPS25 para 5.51)
  - 1 in 100 year no internal flooding of property (as specified in PPS25 para 5.51 and CIRIA C697)

SUDS Adoption and maintenance

Follow requirements of the Floods and Water Management Act (2010). Agree adoption process with CWAC. In general, only SuDS in public open space/associated with adoptable highways will be adopted by CWAC – early discussion advised to confirm. Where SuDS will be located on private land ensure appropriate alternative adoption and maintenance arrangements are made. Detail adoption and maintenance arrangements in FRA/planning application.

Under the Flood and Water Management Act (2010) CWAC is the "approving body" for proposed SuDS. As required by the act, the SuDS should be designed to comply with current national guidance (i.e. CIRIA C697). An application for approval of the SuDS will need to form part of the planning application. Once approved by CWAC (following consultation with relevant organisations - i.e. the Environment Agency, United Utilities/Welsh Water etc) and the resolution of any queries on the systems design, the system can be constructed and inspected to confirm correct construction. Once adopted and responsibility for the drainage systems maintenance will lie with the approving body (CWAC). CWAC may require a fee to assess the proposed SuDS, and a bond to ensure satisfactory completion of the SuDS drainage system. Once adopted the SuDS will be maintained by CWAC in compliance with current national SuDS guidance.

Recommendation 4: Develop SWMPs for Chester and Neston

Based on the concentrations of sewer flooding incidents, and the surface water flooding extents shown by the Environment Agency's indicative surface water flood maps, it is recommended that Surface Water Management Plans (SWMPs) are prepared for Chester and Neston.

In addition, notable concentrations of sewer flooding incidents and areas potentially at risk from surface water flooding occur in Northwich and at Ellesmere Port. Sewer flooding events are also concentrated at Frodsham, Tarvin and Kelsall, although indicative surface water flooding maps show less extensive areas of potential surface water flooding in these areas. It is recommended that the SWMPs scope is focussed on these seven areas (rather than the whole study area), perhaps with an initial focus on Chester and Neston, followed by subsequent studies in the other areas.

This is an indicative assessment based on available data, and further discussions should be undertaken between the Environment Agency, CWaC, United Utilities and Dŵr Cymru Welsh Water to determine the location and scope of SWMPs. The information presented in this Outline WCS should be used in conjunction with the existing SFRA and AFRAs to inform any SWMPS prepared.

The scope of the SWMPs should include more detailed 2D modelling of surface water flow paths (the Environment Agency's surface water flooding dataset is based on relatively coarse elevation data) over the broad areas defined above. Within the study areas, sub-areas identified to be the most at risk by the broad-scale assessment can then be identified for further investigation. Additional flow routes (drainage systems, ditches, underpasses and other features of urban topography) can be represented to refine the 2D modelling. The study should identify key areas of risk (depth/velocity) and key flow path/storage areas. Key areas of existing development and proposed development at risk can then be identified. Inputs from the Environment Agency and the water company will be required to inform the study with regards to the drainage assets for which they are responsible. A typical timescale for a SWMP from data collection, through modelling to the completion of the final report is nine months.

8.2 Water consumption and demand management

The study has shown that water demand management is a vital component of the water companies' strategies to secure public water supplies into the future. The study has also shown the sensitivity of demand in the study area to alternative levels of growth and water efficiency scenarios. Water neutrality is not considered appropriate given the current state of water resources in the North West, but that through encouraging water efficiency in new and existing development, the Council will be actively minimising the amount of additional water taken from the environment in order to meet development goals. The conclusion is that the Local Authority should support the water companies' options to increase metering and raise levels of awareness among local residents of the need to use water wisely.

Recommendation 5: Include water efficiency in local development policies

The water companies currently meter all new properties (commercial buildings and new households). They also offer free meters to customers who opt for one, although levels of promotion and thus take up vary between the two companies. It is recommended that the Council supports the activities of United Utilities and Dee Valley Water in promoting water efficiency in existing households. This can be achieved by:

- Distributing leaflets and information about the financial and environmental benefits of metering and water efficiency measures;
- Leading by example and installing water efficient devices in Council owned or Council managed properties; and
- Providing links from the Council website to direct the public to existing water efficiency information on water company and Environment Agency websites.

The Local Authority has a major role in ensuring that all new homes are built to high levels of water efficiency. In this area it is appropriate for new housing to be built to meet water consumption levels as defined by level 3/4 of the CSH (105 l/h/d) as a minimum. It is recommended that the Core Strategy should be developed to include requirements that developers design and build new homes to meet this water use standard. This level of consumption can be achieved without the need for rainwater harvesting or greywater recycling systems. It is not regarded as excessive or unachievable.

The Council should support opportunities to develop homes to meet CSH level 5/6 (80 l/h/d). However, these levels will require some element of non potable source, e.g. rainwater harvesting and/or greywater recycling. Due to the significant extra costs that are incurred when fitting these types of installations, developers and residents' current levels of understanding of these technologies, and the low level of water stress in this area, it is not recommended that the Council specifies all new developments to meet this target, at the current time.

8.3 Wastewater services

Recommendation 6: Continue working with water companies to align growth and wastewater asset plans

It is recommended that the Council liaises with Dŵr Cymru Welsh Water, United Utilities, and the Environment Agency to confirm growth projections in the catchments served by wastewater treatment works that are at or are close to exceeding their discharge consents and/or hydraulic capacity, e.g. Neston WwTW, Oakmere WwTW, Tarporley WwTW, and Cuddington WwTW.

The Council should liaise with United Utilities regarding the future development in Ellesmere Port and the subsequent need for wastewater infrastructure

8.4 Environmental enhancement

Recommendation 7: Include policy requirements to contribute to environmental enhancements

The Council should develop policies that will require new development to contribute to environmental enhancements. For example, SuDS are primarily a tool for managing surface water but also have an important role to play in the creation of green infrastructure. SuDS features such as swales and attenuation ponds lead to habitat creation and the provision amenity space within new development and these benefit should be considered as the Council develops its green infrastructure strategy.

The requirements for enhanced levels of water efficiency in new developments will also have wider environmental benefits. The inclusion of water efficiency measures in new development will contribute towards ensuring that water resources are managed effectively, but can also have wider environmental benefits associated with reductions in energy use. For example, recent studies have shown that measures that reduce domestic hot water use can contribute significantly towards managing greenhouse gas emissions (Environment Agency, 2008).

As highlighted within this study, the Council should liaise with the Environment Agency to explore any opportunities that development may provide to contribute to the actions in the Middle Dee/Weaver Gowy catchments (Dee/North West RBMPs) and to ensure that the developments it approves are not contrary to the actions that are proposed.

8.5 Development of a detailed water cycle study

The Outline study has highlighted some issues that could potentially constrain development and where further analysis would be beneficial. However, it is not thought necessary to undertake a Detailed Water Cycle Study at this stage. Once site allocations have been confirmed then it might be necessary to examine the precise levels of constraint for specific development sites. Depending on the locations that are selected for development, further detailed study would:

- Determine the water supply and wastewater infrastructure requirements for specific development sites. This study has identified that further investigation may be required for sites in the Northwich and Wincham areas;
- Identify feasible options for achieving level 3/4 of the CSH (water consumption);
- Assess locally specific interactions between suppressed household consumption, sewerage, and discharge effluent volumes;
- Undertake a cost/benefit analysis of development options; funding streams, including financial contributions from developers;
- Assess the sustainability of preferred options with regard to carbon emissions;

- Develop the water cycle strategy for the area; and
- Continue the stakeholder engagement through regular steering group meetings and promote ongoing dialogue between the local authorities and the water companies for monitoring and assessing the impacts of growth on the water resources management in the study area.

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Appendix A
Stakeholder information

The following stakeholders were identified at the project inception meeting. The stakeholders were sent a copy of the information leaflet included in this Appendix. The stakeholders were also provided with the Scoping and Outline WCSs on completion.

Project stakeholders

Natural England

Countryside Council for Wales

Highways Agency

British Waterways

Halton Borough Council (Mid Mersey Growth Point)

Wirral Borough Council (Mersey Heartlands Growth Point)

Flintshire County Council

Wrexham County Council

Cheshire East Council

Shropshire County Council

Appendix A

Cheshire West and Chester Water Cycle Study

Scoping and Outline

Introduction

Cheshire West and Chester Council has commissioned consultants Entec to undertake a combined Scoping and Outline Water Cycle Study.

The vision for the project is to develop an integrated approach to the management of the water environment, through joint working with key partners.

This leaflet provides an overview of what the study involves and the stages of the work for information only.

The Issue

Cheshire West and Chester has been awarded Growth Point status to contribute to the economic development of North West England. The proposals will deliver an additional 2,700 homes between 2007/8 and 2016/17 (on top of the requirement for 11,853 homes set out in the Regional Spatial Strategy, an increase of 23%).

Cheshire is an area faced with significant growth. It is important that this growth is developed in a manner that will ensure sustainable flood risk management, protect sensitive habitats, meet environmental targets set by the European Union, and ensure water resources are used wisely. The growth planned, together with the predicted effects of climate change, is likely to create increased pressure on resources, infrastructure and wastewater treatment.

New developments will need to be located in areas that are not susceptible to flooding, and be developed with the infrastructure necessary to supply water and dispose of wastewater effectively. Development will have to be constructed sustainably to safeguard natural resources and protect local ecosystems. This could involve making better use of and creating natural resources to adapt the environment against the effect of climate change.

The Council's Local Development Framework will determine how and where these new homes will be distributed across the district and at what rate they will be built. They will also set out what supporting infrastructure is required. To ensure that the new homes are planned and delivered in a sustainable manner, a Water Cycle Study is required.

Water Cycle Study

A Water Cycle Study is one of a number of strategic studies used by Local Planning Authorities as part of the evidence base for Local Development Frameworks (LDF). The study aims to identify a phased approach for development so that water and infrastructure services can be planned and implemented in line with the growth requirements of the Local Authority. This will take account of the environmental capacity of water bodies, and infrastructure capacity. The study will make recommendations on how development should proceed and what policies are required to deliver the planned growth without compromising, and where possible enhancing, the water environment.

The main aspects considered in a water cycle study are:

- **Water resources** - increased demand for water and the infrastructure to distribute it.
- **Water quality** - increased generation of sewerage and other waste water, requiring collection and treatment systems. Increased risk to the quality of the water environment including its ecology.
- **Flood risk** - increased waste water or run-off could increase risks of flooding. The

Entec

Cheshire West and Chester

Cheshire West and Chester Water Cycle Study
Scoping and Outline

study will review and include a summary of the **Strategic and Area Flood Risk Assessment** outputs that have been completed.

- Potential for **Sustainable Drainage.**
- **Integration** with adjoining areas (including cumulative impacts of growth).

The Stages

Typically these studies are produced in 3 phases; Scoping, Outline and Detailed. The Scoping Study will be delivered in January 2010, with the Outline Study being produced over the following 3 months. A regional Scoping Study has been completed for the Environment Agency. The study for Cheshire West and Chester Council will use those findings and in addition will scope out the issues affecting the River Dee and the Dee estuary. The stages of a Water Cycle Study are set out below.

Scoping and Outline – This involves a review of the existing requirements for water in the study area, highlighting the key issues and opportunities associated with housing and commercial growth.

The study will assess the requirements for water infrastructure to facilitate development and potential environmental constraints will be identified. The potential to reduce demand for water will be investigated, including the feasibility of delivering water neutral developments. A programme of required water infrastructure against planning deadlines will be identified.

The study will review the flooding constraints in the study area. This phase will also identify issues that require more detailed analysis.

Detailed – The requirement for a Detailed Study is dependant on the outcome of the Outline phase. A Detailed Water Cycle Study takes the findings of the Outline phase and seeks to consider in more detail a strategy for delivering the required water infrastructure and the mechanisms required to fund them. Potential environmental constraints and mitigation are also considered in more detail. It also seeks to coordinate the activities of the parties involved in the delivery of infrastructure to ensure this occurs in a timely and sustainable way.

Stakeholders

The Steering Group comprises Cheshire West and Chester council, Entec, United Utilities, Dee Valley Water, Dŵr Cymru Welsh Water and the Environment Agency. This leaflet is aimed at a range of other stakeholders to inform them of the study, and to notify them that we may require information for the outline phase of the study.

Further Details

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Cheshire West and Chester

Appendix B
Housing Growth Projections

Regional Growth

Table B.1 Distribution of Regional Housing Provision 2003-2021 (excludes Growth Point figures)

	Total Housing Provision 2003 – 2021 (Net of clearance replacement)	Annual Average rates of Housing Provision (Net of clearance replacement)	Indicative target proportion of housing provision to use brownfield land & buildings
Total North West	416,000	23,111	At least 70%
Manchester / Salford			
Manchester	63,000	3500	
Salford	28800	1600	At least 90%
Pennine Manchester			
Oldham	5200	289	
Rochdale	7200	400	
Tameside	13500	750	At least 80%
Southern Manchester / North East Cheshire			
Stockport	8100	450	
Trafford	10400	578	
Congleton	5400	300	
Macclesfield	7200	400	At least 80%
Northern Manchester			
Bolton	10400	578	
Bury	9000	500	
Wigan	17600	978	At least 80%
Liverpool / Knowsley			
Knowsley	8100	450	At least 65%
Liverpool	35100	1950	At least 90%
Mid Mersey			
Halton	9000	500	
St Helens	10260	570	At least 65%
Warrington	6840	380	At least 80%
Wirral			
Wirral	9000	500	At least 80%
South West Lancashire			
Sefton	9000	500	
West Lancashire	5400	300	At least 65%
Greater Preston			
Chorley	7500	417	At least 70%
Preston	9120	507	

	Total Housing Provision 2003 – 2021 (Net of clearance replacement)	Annual Average rates of Housing Provision (Net of clearance replacement)	Indicative target proportion of housing provision to use brownfield land & buildings
South Ribble	7500	417	
Central East Lancashire			
Blackburn with Darwen	8800	489	
Hyndburn	3400	189	
Ribble Valley	2900	161	At least 65%
East Lancashire			
Burnley	2340	130	
Pendle	3420	190	
Rossendale	4000	222	At least 65%
Fylde Peninsula			
Wyre	3700	206	
Blackpool	8000	444	
Fylde	5500	306	At least 65%
West Cumbria and Furness			
Allerdale	4800	267	At least 50%
Barrow in Furness	2700	150	At least 80%
Copeland	4140	230	At least 50%
Lakes & Morecambe Bay			
Eden	4300	239	
South Lakeland	7200	400	
Lake District National Park	1080	60	At least 50%
Lancaster	7200	400	At least 70%
North Cumbria			
Carlisle	8100	450	At least 50%
South Cheshire			
Crewe and Nantwich	8100	450	At least 60%
West Cheshire			
Chester	7500	417	
Ellesmere Port and Neston	7200	400	
Vale Royal	9000	500	At least 80%

Source: Table 7.1 NW RSS

Table B.2 Published Housing Projections in North Wales

	Annual requirement	Fifteen years equivalent
Ynys Môn /Anglesey	175	2,625
Gwynedd	215	3,225
Conwy	355	5,325
SNP	40	600
Denbighshire	425	6,375
Flintshire	480	7,200
Wrexham	420	6,300
North Wales	**2,110**	**31,650**

(Source: Snowdonia National Park Authority Apportionment of North Wales Regional Population, Household and Dwellings Projections). Wrexham and Flintshire are adjacent to West Cheshire.

Table B.3 Published Housing Projections in Shropshire

	RSS Phase 2 Revision Proposed Housing Development 2006 – 2026	Regional and Sub-regional Estimates of Housing Demand in Shropshire			
		Regional Assessment 2006 – 2026 (a)	West Housing Market Assessment 2006 – 2026 (b)	Potential Difference in Housing Supply (a)	(b)
Bridgnorth	2,500 (125 p.a.)	3,000	3,400	-500	-900
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Oswestry	4,000 (200 p.a.)	5,000	5,400	-1,000	-1,400
Shrewsbury & Atcham	8,200 (410 p.a.)	7,000	7,600	1,200	600
Of which, Shrewsbury	6,200 (310 p.a.)	--	--	--	--
South Shropshire	4,900 (245 p.a.)	5,000	5,300	-100	-400
Shropshire	25,700 (1,285 p.a.)	26,000	28,000	-300	-2,300

Source: RSS Phase 2 Revision Preferred Option and Housing Background Paper (January 2008) & West Housing Market Assessment (2008). Figures based on 2004 Household Projections.

The housing projections for Shropshire are correct in terms of the RSS Panel Report, these figures pre-date that assessment. As such the distribution cannot be readily relied upon.

Growth in Cheshire

For purpose of the local scoping study, housing growth was assumed to follow the trajectory set out in the CWaC Programme of Development document. The Environment Agency Regional Scoping study stated that the housing numbers in the RSS will vary slightly from the housing trajectory in the Growth Point ' Programme of Development' "*due to selected uplift rate (uplift above RSS), or because the Programme of Development was produced in advance of the RSS*." Table B.4 compares the growth rates planned for West Cheshire as set out in the RSS and the West Cheshire Programme of Development.

Table B.4 Regional Housing Provision 2003-2021 (North West RSS)

Area	Total Housing Provision 2003 – 2021 (Net of clearance replacement)	RSS Annual Average rate of Housing Provision (Net of clearance replacement)	West Cheshire Potential Growth	Potential Delivery as % of RSS	Indicative target proportion of housing provision to use brownfield land & buildings
Total North West	**416,000**	**23,111**			**At least 70%**
West Cheshire					
Chester	7500	417	517	24%	
Ellesmere Port and Neston	7200	400	500	25%	At least 80%
Vale Royal (principally Northwich and Winsford)	9000	500	600	20%	
West Cheshire Annual Total		**1317**	**1617**	**23%**	
West Cheshire Total		**11853**	**14553**	**23%**	

West Cheshire intends to deliver annual housing rate over nine years

Source: NWRSS and Table 2 West Cheshire Programme of Development

Table B.5 shows the housing growth trajectory that was available at the scoping stage.

Table B.5 Housing Trajectory within the CWaC Programme of Development (2003/04 to 2016/17)

	2001-02	2002-03	RSS 2003-04	2004-05	2005-06	2006-07	2007-08	Year 1 2008-09	Year 2 2009-10	Year 3 2010-11	Year 4 2011-12	Year 5 2012-13	Year 6 2013-14	Year 7 2014-15	Year 8 2015-16	Year 9 2016-17	Total
Past Completions																	
Vale Royal	581	663	445	377	467	460	278	167									3438
Chester	473	298	333	430	585	190	203	267									2779
Ellesmere Port	84	100	284	311	284	149	229	289									1730
West Cheshire	**1138**	**1061**	**1062**	**1118**	**1336**	**799**	**710**	**723**									**7224**
Projected Completions																	
Vale Royal								385	215	291	778	1037	1170	1255	976	528	6635
Chester								464	553	761	549	551	404	390	390	440	4502
Ellesmere Port								243	592	794	1041	1234	1442	1560	1897	2135	10938
West Cheshire								**1092**	**1360**	**1846**	**2368**	**2822**	**3016**	**3205**	**3263**	**3103**	**22075**
Cumulative Completions			1062	2180	3516	4315	5025	6117	7477	9323	11691	14513	17529	20734	23997	27100	
RSS Annualised Requirement			1317	1317	1317	1317	1317	1317	1317	1317	1317	1317	1317	1317	1317	1317	18438
Additional Growth Point Annualised Requirement (23% above RSS)								300	300	300	300	300	300	300	300	300	2700
Total Overall Requirement 2003/04 to 2016/17								1617	1617	1617	1617	1617	1617	1617	1617	1617	**21138**

Source: Appendix 3 CWaC Programme of Development

Information from the 2008-09 Housing Land Monitoring Report (CWaC, 2009d) provides relatively up to date information on completions. These figures have been added into Table B.5 and show clearly that in year 1 of the development programme housing growth across the area was below the projection (369 less than planned). It is likely that housing growth in year 2 is also behind due to the impact of the recession.

A revised and more detailed growth trajectory was made available for inclusion in the Outline study and this is presented in Table B6 below.

Table B.6 Summary of Housing Trajectory per Ward across the Study Area

Ward	Yrs 1 to 5	Yrs 6 to 10	Yrs 11 to 15	Yrs 16 to 18	Sub total	Annual Small Site Allowance*	Total Small Site Allowance (15 years)	Total
Abbey		134	45		179	8	120	299
Blacon		64	161		225	15	225	450
Boughton Heath and Vicars Cross	556				556	20	300	856
Broxton	172	30	100		302	15	225	527
Central and Westminster	2155	1710	1600	816	6281	20	300	6581
City	948	617	613		2178	50	750	2928

Ward	Yrs 1 to 5	Yrs 6 to 10	Yrs 11 to 15	Yrs 16 to 18	Sub total	Annual Small Site Allowance*	Total Small Site Allowance (15 years)	Total
Eddisbury		292			292	5	75	367
Frodsham and Helsby	388	50			438	15	225	663
Gowy			155		155	10	150	305
Grange and Rossmore	39	103	40		182	20	300	482
Groves and Whitby		25			25	20	300	325
Hoole and Newton		123	15		138	20	300	438
Ledsham and Willaston	15	700	35		750	7	105	855
Marbury		664	912		1576	5	75	1651
Mickle Trafford		74			74	10	150	224
Neston and Parkgate	12				12	10	150	162
Northwich East and Shakerley	416	1165	1003		2584	20	300	2884
Northwich West	224	755	1231		2210	20	300	2510
Overleigh		32	47		79	20	300	379
Sutton and Manor	87	470			557	20	300	857
Upton	173				173	20	300	473
Weaver	45		80		125	10	150	275
Winsford North and East	99	1025	470		1594	20	300	1894
Winsford South and West	103	212			315	20	300	615
Grand Total	**5432**	**8245**	**6507**		**21000**	**400**	**6000**	**27000**

*Sites not allocated

Appendix C
Planning context

The planning policy framework for Cheshire West and Chester includes national, regional, sub regional and local planning policies. This framework sets out guidance and requirements for delivering sustainable development and therefore addresses, amongst other things: housing and employment growth; water management and protection; infrastructure provision; and flood risk management. The following sections outlines those elements of planning guidance which are considered to be of most relevant to this Water Cycle Study,

National Planning Policy

Government guidance is provided through a series of Planning Policy Guidance (PPG) and Planning Policy Statements (PPSs), the most relevant of which are summarised below.

PPS 1 – Delivering Sustainable Development and the Supplement to PPS1: Planning and Climate Change

An important theme in government planning policy is the need to achieve sustainable development which includes dealing with Climate Change. PPS1 requires Regional Planning Bodies (RPBs) and local planning authorities (LPAs) to prepare development plans which ensure that development is pursued in line with the principles for sustainable development and promote outcomes in which environmental, economic and social objectives are achieved together over time. This should be achieved using a spatial planning approach.

Specifically, planning authorities should identify land suitable for meeting housing and other types of development taking into account the need to provide essential infrastructure and to avoid flood risk. In addition they should address the issue of climate change; the management of pollution; and the minimisation of impacts from the management and use of resources based upon sound science. PPS1 advises that regional planning authorities and local authorities should promote amongst other things the sustainable use of water resources and the use of sustainable drainage systems in the management of runoff.

The PPS1 supplement advises local planning authorities that when deciding suitable locations for development, and for what type and intensity, they should take into account the capacity of existing and potential infrastructure including water supply, sewage and sewerage, to service the site or area in ways consistent with successfully adapting to likely changes in the local climate. In addition, they could consider physical and environmental constraints such as sea level rises, flood risk and stability, and take a precautionary approach to increases in risk which may arise as a result of potential changes to the climate.

PPS 3 – Housing

PPS3 was published in November 2006 and replaces PPG3 and its various annexes. A principal aim of the new PPS3 is to underpin the Government's response to the *Barker Review of Housing Supply*[28] and to bring about the necessary step-change in housing delivery, through a new, more responsive approach to land supply at the local level to improve the affordability and supply of housing.

It is based on a strategic approach in which Local Planning Authorities and Regional Planning Bodies should develop and deliver a spatial vision for their areas through the planning policy framework. This should be based on the principles of sustainable development and integrate other strategies including economic and community strategies.

The PPS includes both strategic housing policy objectives and planning objectives. In strategic terms, the Government's aim is "is to ensure that everyone has the opportunity of living in a decent home, which they can afford, in a community where they want to live".

Most future development across West Cheshire and Chester will be for housing. PPS3 requires that new housing should be built on previously developed land (PDL) before building on greenfield land. PPS25 (see below) reiterates this requirement in its 'Exception Test'.

PPS9 – Biodiversity and Geological Conservation

PPS9 sets out planning policies on the protection of biodiversity and geological conservation through the planning system. Development plan policies and planning decisions should be based upon up-to-date information regarding the environmental characteristics of their area. The aim of planning policies and planning decisions should be to prevent harm to biodiversity and geological conservation interests. In addition, planning policies should promote opportunities for the incorporation of beneficial biodiversity features as part of new development.

PPS 12 – Creating Strong, Safe and Prosperous Communities through Local Spatial Planning

PPS 12 was published in June 2008. It outlines the nature of local spatial planning and the key components of local spatial plans and how they should be prepared. It should be taken into account by local planning authorities in preparing Local Development Frameworks (LDFs) which include development plan documents (DPDs) and other local development documents (LDDs).

With regard to infrastructure, PPS12 states that core strategies, "*should be supported by evidence of what physical, social and green infrastructure is needed to enable the amount of development proposed for the area, taking account of its type and distribution. This evidence should cover who will provide the infrastructure and when it*

[28] *Review of Housing Supply, Delivering Stability: Securing our Future Housing Needs*, HM Treasury, 2004.

will be provided. The core strategy should draw on and in parallel influence any strategies and investment plans of the local authority and other organisations".

The Water Cycle Study forms part of the robust and credible evidence base which will underpin policies within the Core Strategy and other relevant LDDs.

PPS23: Planning and Pollution Control

PPS23 requires air and water quality to be taken into account in the determination of planning applications. The guidance is accompanied by two annexes the first of which relates to air quality and the second to contamination.

PPS23 identifies that the following matters should be considered in the preparation of development plan documents and in the determination of planning applications where pollution considerations arise:

- The potential sensitivity of the area to adverse effects from pollution, in particular reflected in landscape, the quality of soil, air and ground and surface waters, nature conservation (including SSSI), National Parks, Areas of Outstanding Natural Beauty (AONB), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Wetland of International Importance (Ramsar sites), agricultural land quality, water supply (SPZs), archaeological designations and the need to protect natural resources;
- The possible adverse impacts on water quality and the impact of any possible discharge of effluent or leachates which may pose a threat to surface or underground water resources directly or indirectly through surrounding soils;
- The need to make suitable provision for the drainage of surface water; and
- The provision of sewerage and sewage treatment and the availability of existing sewage infrastructure.

PPS 25 – Development and Flood Risk

PPS25 (as amended December 2009) sets out Government policy on development and flood risk. It aims to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas of highest risk. It also aims to ensure that new development does not increase the risk of flooding elsewhere. Where, in exceptional circumstances, new development is necessary in such areas then the aim is to make it safe without increasing flood risk elsewhere and, where possible, to reduce flood risk overall.

PPS25 stipulates that all planning applications for developments greater than 1 hectare must be accompanied by a Flood Risk Assessment detailing surface water management plans to demonstrate that runoff does not increase from the proposed development once it has been built and that runoff is not simply moved elsewhere.

This approach is supported in the Government's Pitt review of the summer 2007 flooding, in which the comments in PPS25 are reiterated. It makes it clear that developments within flood zone 2 and 3 should not be allowed to

proceed unless there is clear proof that they are compatible developments for these zones, and that Local Planning Authorities (LPAs) should become responsible for local flooding.

Regional Planning Policy

The North West of England RSS (2008) provides a broad development strategy for the Region to 2021. The following key spatial principles underpin the policies within the RSS:

- Promote sustainable communities;
- Promote sustainable economic development;
- Make the best use of existing resources and infrastructure;
- Manage travel demand, reduce the need to travel and increase accessibility;
- Marry opportunity and need;
- Promote environmental quality;
- Mainstream rural issues; and
- Reduce emissions and adapt to climate change.

The RSS is required by the Planning and Compulsory Purchase Act 2004, and matters of process and content are prescribed in PPS11. Local Development Documents (LDDs), which are prepared by Local Planning Authorities, must be in general conformity with the RSS. Planning applications will be considered against the provisions of RSS and relevant Local Development Documents. The draft RSS was amended in response to a formal consultation process held between March and June 2006, and the Examination in Public (EiP) between October 2006 and February 2007. The Final RSS replaces all earlier versions.

Within the RSS the Cheshire West and Chester Area is identified as being within the Liverpool City Sub-Region. Policy LCR1 sets out the priorities for the Liverpool City Sub-Region which include promoting the sustainable growth, local regeneration and development opportunities in the West Cheshire / North East Wales sub-region. Development in West Cheshire is identified as being focused on harnessing opportunities for sustainable growth and local regeneration. Policy LCR5 states that plans and strategies within West Cheshire should:

- Focus development in towns and cities (Ellesmere Port and Northwich) and at other locations which harness the potential for Chester for sustainable growth as a key sub-regional centre for employment, shopping, leisure, culture and tourism;
- Improve internal and external transport links, in particular with North East Wales;
- Ensure the strategic planning and management of the sub-regions economy, housing market, transport network and environmental and cultural assets.

All of this will increase the demand for water and wastewater services in the area.

Policy DP4 “Make the Best Use of Existing Resources and Infrastructure” sets out the considerations that should be taken into account when planning development locations. The Regional/sub-regional policy is to “build upon existing concentrations of activities and existing infrastructure, and to try to avoid the need for major investment in new infrastructure, including water supply and sewerage. Where this is unavoidable development should be appropriately phased to coincide with new infrastructure provision”. Flood risk is covered under Policy DP 2 “Promote Sustainable Communities” with regard to ensuring a safe environment for people to live.

The priority for development is 1) to use existing buildings (including conversion) within settlements, and previously developed land within settlements; 2) to use other suitable infill opportunities; and 3) to develop other land where this is well-located.

Policy DP 7, “Promote Environmental Quality” seeks to protect the quality of the environment in the region. This includes maintaining and enhancing the quantity and quality of biodiversity and habitat; and ensuring that plans that could have a significant effect on the conservation objectives of designated sites are subject to assessment. This includes assessment and mitigation of the potential impacts of development on air quality, water quality and water levels.

The RSS demonstrates an overall commitment to conserving the environment, and reducing waste and energy consumption. It states that water efficiency and sustainable drainage should be encouraged in new and existing developments (through retrofitting).

Areas adjacent to West Cheshire (South Cheshire, North Shropshire and North Wales, including Wrexham) are covered by the South Cheshire Sub-Regional Study (SCSRS), and West Cheshire and North East Wales RSS respectively. The South Cheshire Sub-Regional Study was formulated in response to the recognised need in the North West RSS Panel Report for a study to consider the inter-regional relationships.

Appendix C