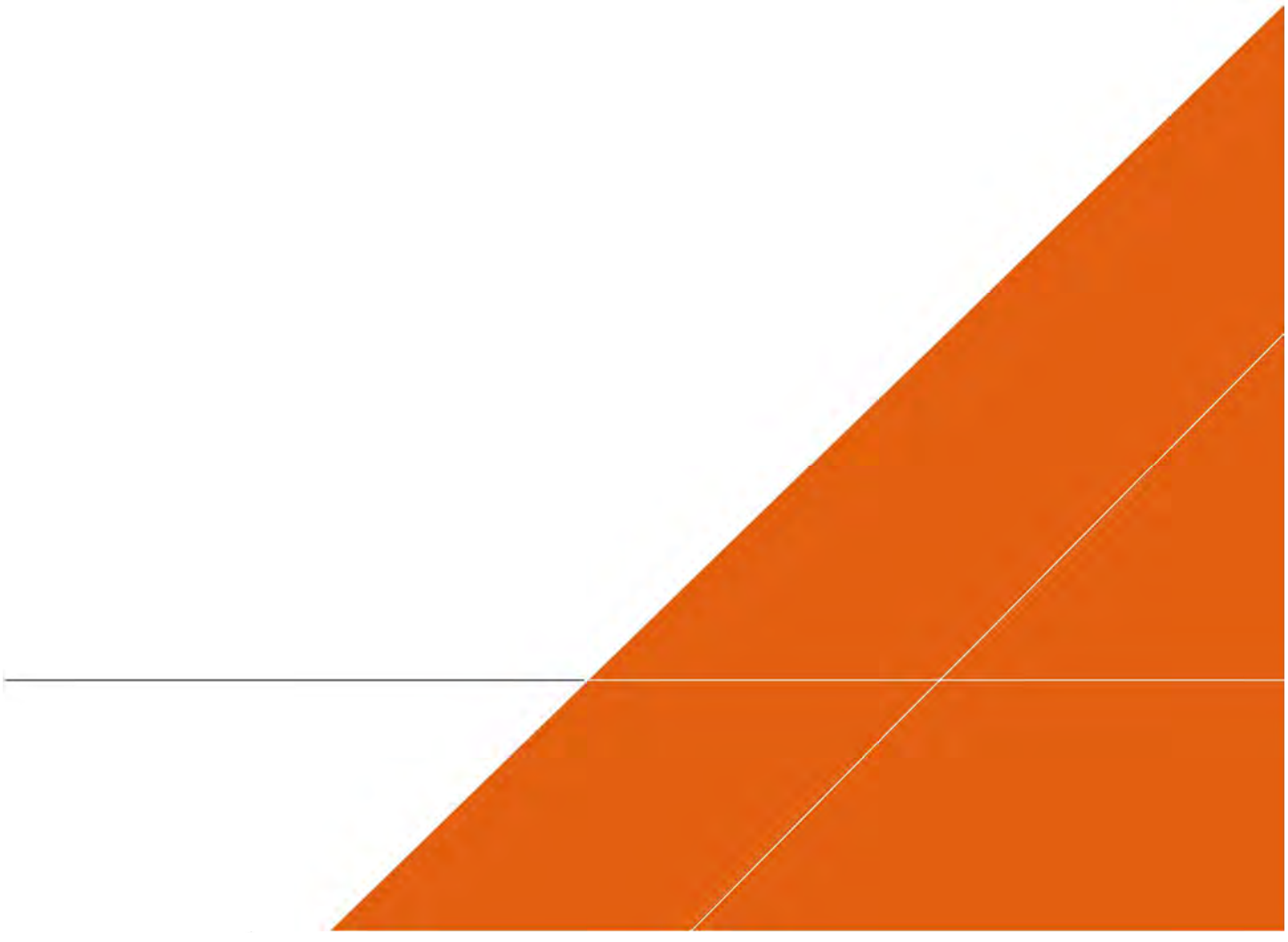
ARCADIS Design & Consultancy for natural and built assets

UTTLESFORD DISTRICT WATER CYCLE STUDY

Outline Update

JANUARY 2017



CONTACTS

RENUKA GUNASEKARA
Technical Director

dd +44 (0)121 345 9026
m +44 (0) 7793 187 700
e Renuka.Gunasekara@arcadis.com

Arcadis.
The Surrey Research Park
10 Medawar Road
Guildford
GU2 7AR
United Kingdom

VERSION CONTROL

Version	Date	Author	Changes
D1	28.11.2016	Tom De La Rosa Aimee Hart	Draft Issue
F1	17.01.2017	Aimee Hart	Final Issue following comments
F2	24.01.2017	Aimee Hart	Final Issue following comments

CONTENTS

APPENDICES

Technical Glossary

- **Asset Management Period (AMP)** - A period of five years in which water companies implement planned upgrades and improvements to their asset base. For example, AMP5 is 2010-2015 and AMP6 is 2015-2020.
- **Biochemical Oxygen Demand (BOD)** – a measure of the oxygen demand that results from bacteria breaking down organic carbon compounds in water. High levels of BOD can use up oxygen in a watercourse, to the detriment of the ecology.
- **Catchment Abstraction Management Strategies (CAMS)** - the production of a strategy by the Environment Agency (EA) to assess and improve the amount of water that is available on a catchment scale. The latest CAMS strategies can be found at: https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process/
- **Combined Sewer Overflow (CSO)** – a point on the sewerage network where untreated wastewater is discharged during storm events to relieve pressure on the network and prevent sewer flooding. Sewerage systems that are not influenced by storm water should not require a CSO.
- **Deployable Output** – the amount of water that can be abstracted from a source (or bulk supply) as constrained by environment, license, pumping plant and well/aquifer properties, raw water mains, transfer, treatment and water quality.
- **Discharge Consent** – a consent issued and reviewed by the EA which permits an organisation or individual to discharge sewage effluent or trade effluent into surface water, groundwater or the sea. Volume and quality levels are set to protect water quality, the environment and human health.
- **Water Resource Management Plan (WRMP)** - Currently in their draft stages awaiting approval by OFWAT later this year, the Water Resource Management Plans are studies undertaken by every water company in England to determine the availability of water resources for the next 25 years. WRMPs can be found on most water company websites.
- **Dry Weather Flow (DWF)** – an estimation of the flow of wastewater to a Water Recycling Centre during a period of dry weather. This is based on the 20th percentile of daily flow through the works over a rolling three year period.
- **Dry Year Critical Period (DYCP)** – the period of time during which the customer experiences the greatest risk of loss of potable water supply, during a year of rainfall below long-term average (characterised with high summer temperatures and high demand).
- **Eutrophication** – higher than natural levels of nutrients in a watercourse, which may lead to the excessive build-up of plant life (especially algae). Excessive algal blooms remove valuable oxygen from the watercourse, block filters at water recycling centres, affect the taste and smell of water, and can be toxic to other wildlife.
- **General Quality Assessment (GQA)** – The current assessment method used by the EA to describe the chemical and biological quality of watercourses, along with nutrient levels and aesthetic quality. More information is included in Appendix C.
- **Habitats Directive** - promotes biodiversity by requiring measures to be taken to maintain or restore natural habitats and wild species to a favourable conservation status, introducing robust protection for those habitats and species of European importance.
- **Local Plan** – A document outlining the spatial planning strategy for each local authority. The Local Plan will contain a number of statutory documents setting out the long term planning and land use policies for a given area.
- **Local Nature Reserve (LNR)** – are areas with wildlife or geological features that are of special interest locally. Details of LNR can be found at http://www.natureonthemap.org.uk/.
- **National Nature Reserve (NNR)** – are areas of national importance, protected because they are amongst the best examples of a particular habitat in the country. Details of NNR can be found at http://www.natureonthemap.org.uk/.
- **National Planning Policy Framework (NPPF)** - The National Planning Policy Framework sets out government's planning policies for England and how these are expected to be applied. The framework

acts as guidance for local planning authorities and decision-takers, both in drawing up plans and making decisions about planning applications.

- **Natura 2000 Sites** - Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. It stretches across all 28 EU countries, both on land and at sea. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats, listed under both the Birds Directive and the Habitats Directive. More information is available at: http://ec.europa.eu/environment/nature/natura2000/index_en.htm.
- **Optant –** In terms of water supply the term optant is used to describe customer driven water reducing measures. A customer can choose to use these measures under recommendation from the water supplier.
- **Per Capita Consumption (PCC)** – the volume of water used by one person over a day, expressed in units of litres per person per day (l/p/d).
- **Population Equivalent** – is a method of measuring the loading on a Water Recycling Centre, and is based on a notional population comprising; resident population, a percentage of transient population, cessed liquor input expressed in population, and trade effluent expressed in population.
- **Potable Water** – is water that is fit for drinking, being free of harmful chemicals and pathogens. Raw water can be potable in some instances, although it usually requires treatment of some kind to bring it up to this level.
- **Raw Water** - is water taken from the environment, which is subsequently treated or purified to produce potable water.
- **River Basin Management Plans (RBMP)** – documents being produced for consultation by each of the EA regions to catalogue the water quality of all watercourses and set out actions to ensure they achieve the ecological targets stipulated in the WFD.
- **River Ecosystem (RE) Targets** – are the targets uses to assess quality against the above mentioned RQO.
- **River Quality Objective (RQO)** - targets for all rivers in England and Wales that specify the water quality needed in rivers if we are to be able to rely on them for water supplies, recreation and conservation.
- **Site of Special Scientific Interest (SSSI)** - an area of special interest by reason of any of its flora, fauna, geological or physiographical features (basically, plants, animals, and natural features relating to the Earth's structure). A map showing all SSSI sites can be found at: http://www.natureonthemap.org.uk/.
- **Source Protection Zones (SPZ)** - zones designated around public drinking water abstractions and sensitive receptors which detail risk to the groundwater zone they protect.
- **Special Area for Conservation (SAC)** - a site designated under the European Community Habitats Directive, 1991, to protect internationally important natural habitats and species. A map showing all SAC sites can be found at http://www.natureonthemap.org.uk/.
- **Special Protection Area (SPA)** - sites classified under the European Community Directive on Wild Birds to protect internationally important bird species. A map showing all SPA sites can be found at: http://www.natureonthemap.org.uk/.
- **Strategic Flood Risk Assessment (SFRA)** – document required by PPS25 that informs the planning process of flood risk and provides information on future risk over a wide spatial area. It is also used as a planning tool to examine the sustainability of the proposed development allocations.
- **Strategic Housing Market Assessment (SHMA)** - A study of local housing markets to assess needs and demand for different types of housing in the District.
- **Surface Water Management Plans (SWMP)** – assist in the assessment of flood risk to ensure that increased levels of development, and climate change, do not have an adverse impact on flooding from surface water sources within the catchment. SWMP were introduced following the severe flooding in 2007, as means for Local Authorities to take the lead in reducing flood risk.
- **Sustainable Drainage Systems (SuDS)** – a combination of physical structures and management techniques designed to drain, attenuate, and in some cases treat, runoff from urban (and in some cases rural) areas.

- **Target Headroom** - the threshold of minimum acceptable headroom, which would trigger the need for water management options to increase water available for use or decrease demand.
- **Type A Villages** – villages with a primary school with some local services e.g. village hall / pub / shop.
- **Urban Wastewater Treatment Directive (UWWTD) 1991** – A European Union directive (91/271/EEC) which sets treatment levels on the basis of sizes of wastewater discharges and the sensitivity of waters receiving the discharges. Under the Directive the UK is required to review environmental waters at four-yearly intervals to determine whether they are sensitive to the effects of wastewater discharges.
- **Water Available for Use (WAFU)** – the amount of water remaining after allowable outages and planning allowances are deducted from deployable output in a WRZ.
- **Water Framework Directive (WFD) 2000** - A European Union directive (2000/60/EC) which commits member states to make all water bodies of good qualitative and quantitative status by 2015. The WFD could have significant implications on water quality and abstraction. Important dates for the WFD are:

  2015
  - Meet environmental objectives
  - First management cycle ends
  - Second river basin management plan and first flood risk management plan

  2021
  - Second management cycle ends

  2027
  - Third management cycle ends, final deadline for meeting objectives
- **Water Neutrality** – the concept of offsetting demand from new developments by making existing homes and buildings more water efficient.
- **Water Resource Zone (WRZ)** – are areas based on the existing potable water supply network and represent the largest area in which water resources can be shared.
- **Wastewater** - is any water that has been adversely affected in quality by anthropogenic influence. It comprises liquid waste discharged by domestic residences, commercial properties, industry, and/or agriculture.
- **Water Recycling Centre (WRC)** – facility which treats wastewater through a combination of physical, biological and chemical processes.

1 Executive Summary

This Water Cycle Study WCS update has been commissioned by Uttlesford District Council to provide evidence that the development proposed within the emerging Local Plan can be accommodated by the water and wastewater infrastructure, and wider water environment.

Baseline data, collected from the steering group members, has been assessed along with current and emerging legislation. The potential impact of the proposed development on water resources, the current water and wastewater infrastructure, and the water environment, has been analysed.

1.1 Water Resources and Supply Infrastructure

The Uttlesford District is partly underlain by a chalk aquifer of regional importance and the Environment Agency currently class the surface water and groundwater resources within the District as over-licensed or over-abstracted, meaning that there is no additional water available for supply. This highlights the importance of further developing policies to encourage the conservation of water in new and existing dwellings, and commercial properties.

Affinity Water supply the District with water from a combination of groundwater and surface water abstractions, some of which are outside the District, allowing additional water to be transferred into the District to accommodate the supplied growth. However, the scale of growth proposed throughout the East of England, and increasing pressure from environmental constraints, means that high levels of water efficiency are still required. This is particularly important in existing dwellings, where reductions in water consumption have the potential to offset the increased demand from new dwellings.

The Affinity Water's Water Resource Management Plan assesses the supply and demand within the area. Affinity Water are confident that the potential development sites can be supplied without the need for major infrastructure upgrades that will constrain the proposed development.

It is recommended that Uttlesford District Council should consider including a development control policy, requiring developers to show how, through the installation of certain components and fittings, water use per person per day will be limited to a lower rate than the current statutory requirements. Also for new settlements substantial new water supply infrastructure will be required to serve the population. It is recommended that site specific assessments are undertaken as part of the development planning process to cover the detailed requirements of these sites.

1.2 Wastewater Treatment and Sewage

Wastewater in the District is collected and treated by Thames Water Utilities in the southwest and Anglian Water Services in the northeast.

The treatment capacity of each water recycling centre (WRC) and discharge consent constraints are summarised below along with sewer network capacity issues.

Table 1: Summary of Wastewater Treatment Process, Sewerage Infrastructure (excluding the impact of New Settlements)

WRC Catchment	Community Served	Wastewater Treatment	Foul Sewerage Network
Saffron Walden	Saffron Walden	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Great Dunmow	Great Dunmow	There is capacity available to serve the development trajectory following the ongoing upgrades.	Minimum upgrades required to accommodate development trajectory.

WRC Catchment	Community Served	Wastewater Treatment	Foul Sewerage Network
Bishop's Stortford	Takeley Little Canfield	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Great Easton	Thaxted	Upgrades are required to the treatment process to be able to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Newport	Newport	Major upgrades are required to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Stansted Mountfitchet	Elsenham Stansted Mountfitchet	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.

A high-level exercise has been undertaken to assess the impact of the new settlements. Where the WRC is already impacted from the development described above these have been considered together in order to assess the full impact:

- **Great Chesterford** – the cumulative flow including the New Settlement is estimated to exceed the existing consent, assuming that the WRC serves the New Settlement site at Great Chesterford.
- **Stansted Mountfitchet** - the cumulative flow including the New Settlement is estimated to exceed the existing consent, assuming that the WRC serves the New Settlement site at Elsenham.
- **Bishop's Stortford** - the cumulative flow including the New Settlement is estimated not to exceed the existing consent, assuming that the WRC serves the New Settlement site at Little Easton.
- **Felsted** - the cumulative flow including the New Settlement is estimated to exceed the existing consent, assuming that the WRC serves the New Settlement site at Stebbing.

Overall following consultation with Anglian and Thames Water no significant sewerage capacity issues with any of the sites, using the draft development trajectory were identified as potential "show stoppers". However, many of the sites would likely require some upgrades where necessary in order to accommodate the increased flow. Developers should contact Anglian and Thames Water in order to assess what upgrades are required following the Site Allocation process as part of pre-development enquiries as the individual sites enter the normal planning application process.

1.3 Water Quality

The results of the qualitative water quality analysis indicate that the proposed development will not lead to a Deterioration of WFD status or will compromise the achievement of WFD Good status in the receiving watercourses although tightened water quality parameters will be required where WRC flow consents have been exceeded. It is likely that tightening of water quality standards set by discharge permits. Developers should engage with the EA and Water Companies as soon as possible in the planning process to facilitate timely site specific assessments are negotiations are undertaken to address the identified constraints.

1.4 Flood Risk Management

Following a review of the Uttlesford Strategic Flood Risk Assessment and the latest Environment Agency Flood Map, the following key constraints to the proposed New Settlement Sites have been identified in Table 2.

Table 2: Flood Risk Constraints to the development sites

Settlement	Site Ref	Type	Flood Risk Constraint
Elsenham	07Els15	New Settlement	The northern portion of the site is bisected by the existing watercourses (River Cam and associated tributaries). The Stansted Brook bisects the centre of the site, to the south of Henham Road. In the low lying areas corresponding to the watercourses there are associated high and medium risk areas of fluvial and surface water flooding.
Great Chesterford	10GtChe15	New Settlement	The site is not located in an area at extensive risk of surface or fluvial risk of flooding. There are limited areas of flooding along the corridors of existing watercourses (tributary of River Cam) along the southern edge of the site.
Little Easton	06LtEas15	New Settlement	The site is bordered along the western edge by the River Roding and its associated floodplain. Existing watercourses located in low lying areas of the site have surface water flood risk identified. Key area at risk is the central portion of the site.
Stebbing	06Ste15	New Settlement	The Southern portion of site located in Flood Zones 2 and 3. Remainder of site in low risk fluvial zone. Surface water flood risk is present in ditches within site, mainly within the southern portion.
	05Ste15	New Settlement	The majority of the site is in low risk fluvial Flood Zone 1. The North eastern boundary of the site is located in Flood Zone 2 and 3. High surface water flood risk in low lying topography in the middle of the site.

1.5 Conclusions For New Settlements

The Water Cycle Study Update conclusions in relation to the draft trajectories for the potential New Settlement locations (assuming 1400 dwellings per site until 2032) that are under consideration by the emerging Uttlesford Local Plan are listed below. All four sites have a similar level of general constraints and opportunities in relation to water management although the main differentiating constraint to development is considered to be the capacity of the receiving water recycling centres. It should be noted that any planned upgrade to the receiving water recycling centres need to take into account future potential growth of the sites post 2032.

Following consultation with Anglian Water and Thames Water and in light of the above results the following conclusions can be drawn for each potential New Settlement location:

- **Great Chesterford** – Existing flow consents are exceeded due to the new settlement but wastewater capacity could be provided subject to major upgrades to both the treatment processes and associated sewerage networks at the water recycling centre. The extent of the required enhancement may justify other alternative strategies such as a new WRC or conveyance to Saffron Walden catchment if viable. Anglian Water have concerns regarding the level of growth and should be engaged by the site promoter as early as possible.
- **Elsenham** – Existing flow consents are exceeded due to the new settlement, however wastewater capacity could be provided subject to significant upgrades to Stansted Mountfitchet water recycling centre. Thames Water have concerns regarding the level of growth and should be engaged by the site promoter as early as possible.
- **Little Easton** – Existing flow consents are not exceeded due to the new settlement however there are process constraints at Bishop's Stortford water recycling centre. Thames Water have confirmed that upgrades will be expected along with concerns regarding the level of growth and should be engaged by the site promoter as early as possible.
- **Stebbing** – Existing flow consents are significantly exceeded at Felsted water recycling centre, and it is not likely that upgrades can be undertaken to provide wastewater capacity. Following consultation with Anglian Water they have confirmed that new water recycling centres would likely be required and that they should be engaged by the site promoter as early as possible.

2 Introduction

Uttlesford District Council (UDC) previously prepared a Stage 1 Water Cycle Study (WCS) (Scoping and Outline Strategy) in 2010 and a Stage 2 WCS (Detailed Strategy) in 2012. They are now out of date as they were prepared in relation to a previous Local Plan that did not proceed to the formal adoption stage. The 2012 study concluded there were potential constraints to the proposed development relating to the sewer and wastewater treatment capacity in some areas without suitable upgrades, including Great Dunmow, Newport, Saffron Walden, Great Chesterford and Thaxted.

At the time of preparing this study, the new emerging Local Plan is looking to allocate sites for 4,600 new dwellings with the proposed distribution strategy for Uttlesford District. Therefore, an update is required to the 2012 WCS to assess the likely impact of new development on the existing water environment.

The purpose of this Outline WCS update is to provide a robust evidence base to support the growth proposals and emerging strategy policies set out by UDC to assist in the preparation of their emerging Local Plan Submission document. A Detailed WCS may be required to support the final Submission document.

Consultation has been undertaken with Anglian Water (AWS), Thames Water (TW), Affinity Water (AW) and the Environment Agency (EA) as well as other relevant parties in order to provide an indication of the most up to date requirements for the water cycle and infrastructure impacts. These requirements have been reviewed on a site by site basis in reference to the locations identified in the emerging Local Plan detailing any issues and constraints for each.

2.1 The Water Cycle

The natural water cycle is the process by which water is transported throughout a region. The process commences with some form of precipitation, be it rain, snow, sleet or hail. This is then intercepted by the ground and either travels overland through the process of surface runoff to rivers or lakes, or percolates through the surface and into underground water aquifers.

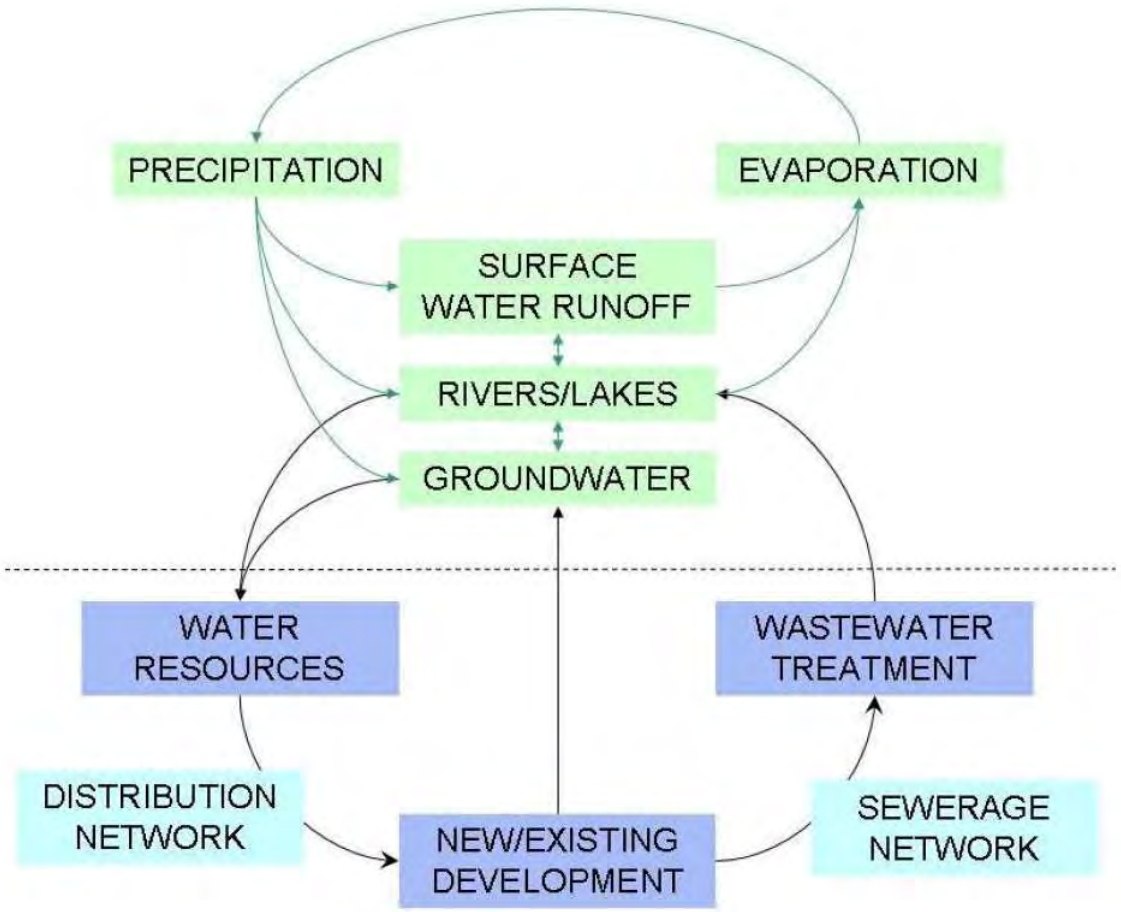
The presence of vegetation can also intercept this precipitation through the natural processes that plants carry out, such as transpiration and evapo-transpiration. The water will eventually travel through the catchment and will be evaporated back into the atmosphere along the way, or will enter the sea where a large amount will be evaporated from the surface. This evaporated water vapour then forms into clouds and falls as precipitation again to complete the cycle.

Urbanisation creates a number of interactions with the natural water cycle. Abstraction of water, from both surface water and groundwater sources for use by the local population, interacts with the water cycle by reducing the amount of water that is naturally held within the aquifers. Following treatment at a Water Recycling Centre (WRC) this water, now potable, is transported via trunk mains and distribution pipes to the dwellings in the area. The potable water is then used by the population within the dwellings for a number of different purposes, which creates large volumes of wastewater.

The use of paved and other surfaces in this development also reduces the amount of water that is able to percolate through the ground to the groundwater aquifers. This therefore increases the rate of surface water runoff, which leads to flooding and increased peak discharges in rivers.

The wastewater from the developments is transported via the sewerage network to a water recycling centre (WRC), where the water is screened, treated, and then discharged back into the rivers or groundwater. Discharges from WRC require consent from the EA. This consent will set out the maximum volume of treated wastewater that can be discharged, and the quality standards that this discharge must meet. Typically, the consent will set limits on the concentrations of the following physiochemical determinands: Ammoniacal Nitrogen (Amm. N), Biochemical Oxygen Demand (BOD) and suspended solids in the discharge. In addition, the consent can stipulate a Phosphorous (SRP) concentration, along with limits on the concentrations of other chemicals (such as Iron) used in the Phosphorous stripping process.

Figure 1- The wider Water Cycle



2.2 Study Area

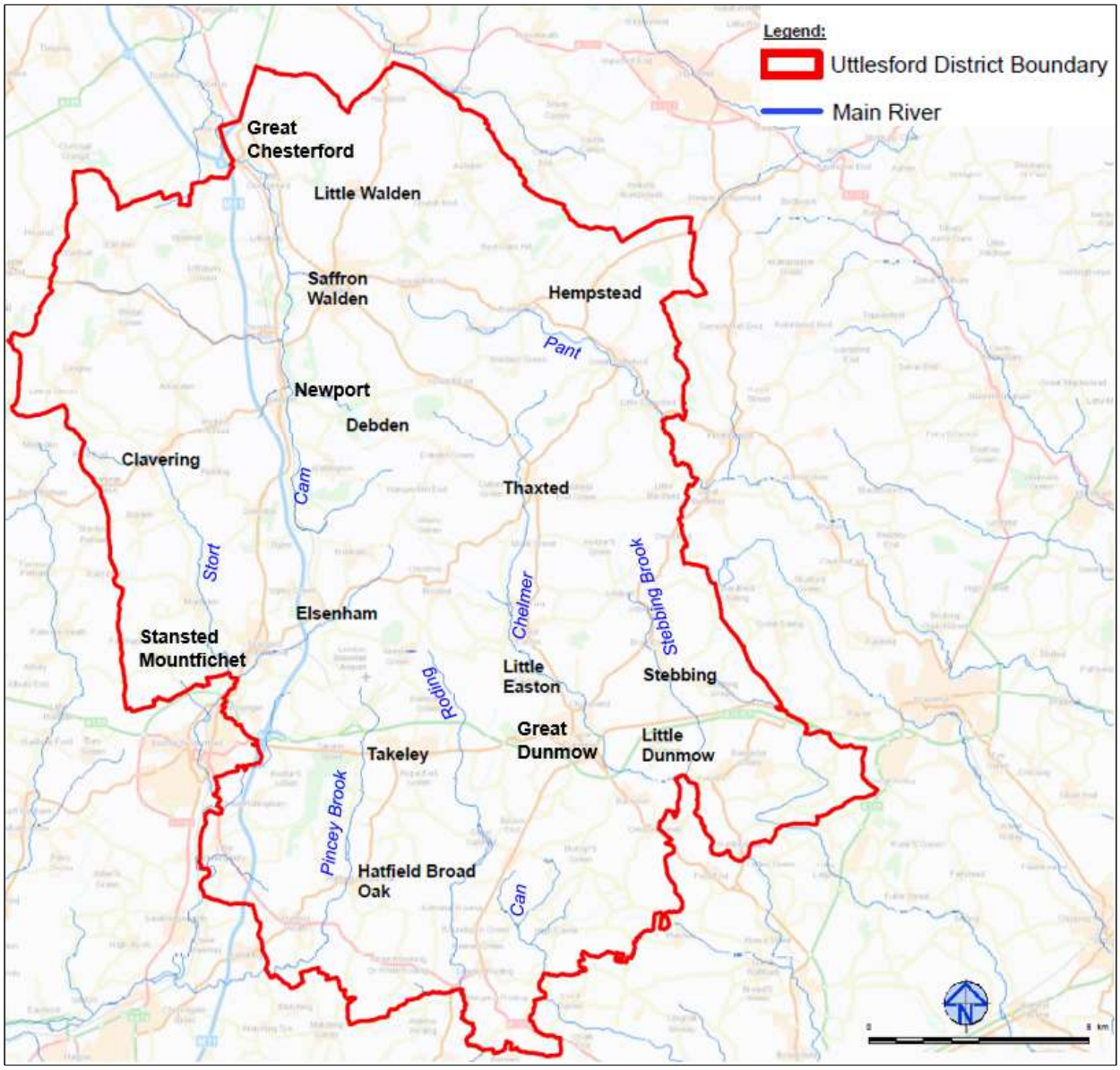
Uttlesford District is located in the northwest of the County of Essex, in the East of England. The District is predominantly rural in nature, although it includes the market towns of Great Dunmow and Saffron Walden, and the key service centres of Elsenham, Great Chesterford, Newport, Stansted Mountfitchet, Takeley, and Thaxted. The District also contains a large number of smaller villages.

In respect to the water environment, Uttlesford District is located at the headwaters of four river catchments:

- The Cam and Ely Ouse;
- The Combined Essex rivers (Rivers Cam, Chelmer, Ter and Pant, and Stebbing Brook);
- The Roding, Beam and Ingrebourne; and
- The Upper Lee (River Stort and Pincey Brook).

Figure 2 below illustrates the locations of the main watercourses within the catchment in relation to the larger settlements. These river catchments are described in more detail in Section 3.

Figure 2- Study Area



As set out in the Detailed Study, the northern half of the District is underlain by the chalk aquifer (a major store of the UK's groundwater resources). However, the majority of the chalk in the District is overlain by a layer of clay. More information regarding water resources is included in Section 5.

Potable water is supplied to the District by Affinity Water and the District lies completely within WRZ5 in the Central region. This WRZ is supplied via a number of groundwater abstractions from the underlying chalk aquifer and the import of treated water from neighbouring water companies. More information regarding potable water supply is included in Section 5.

The companies responsible for collecting and treating wastewater within the District are AWS and TWU. More information is included in Section 6.

Sources of flood risk within the District were identified in the Uttlesford District Strategic Flood Risk Assessment (SFRA). Key messages from this report, and other relevant flood risk policies, are highlighted and built upon in Section 7.

2.3 Key Stakeholders

Stakeholder engagement is key to informing and providing an evidence base for the WCS in terms of the water resource, wastewater treatment capacity and water environmental capacity constraints. The following Stakeholders have been engaged throughout the WCS process from Outline to Detailed Stages:

- EA - Water Resources and Water Environment;
- AWS - Sewerage and Wastewater;
- TWU - Sewerage and Wastewater; and
- AW - Water Resources and Supply.

Consultations have been undertaken through teleconferences and representation provided to UDC. A data register of information received from Stakeholders can be seen in Appendix A.

3 Water Environment Evidence Review

3.1 Policy Context

The following sections introduce the changes to national policies that were previously not discussed in the Detailed Study. Key extracts from these policies relating to new national planning policies and mitigating the impacts on the water environment from new development are summarised below.

3.1.1 National

3.1.1.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and represents an effort by the Government to achieve a reduction in the complexity of the planning system. It replaces the majority of the former Planning Policy Guidance documents (PPGs) and Planning Policy Statements (PPSs). A technical guidance document on flood risk and minerals was also issued in support of the NPPF as an interim measure pending a wider review of guidance.

The NPPF relies on the fact that specific details of the requirements previously obtained from national planning policy will be set out in local plans. These plans will be founded on a locally developed evidence base, including relevant technical studies, such as this Water Cycle Study. By emphasising the importance of local plans local communities will feel empowered to decide the look and feel of the local area.

Local authorities should ensure that planning documents consider these policies, and they can use some of the policies contained within NPPF to make decisions on individual planning applications.

The key themes in NPPF that are most relevant to this WCS are:

- Delivering Sustainable Development and Climate Change;
- Housing;
- Biodiversity and Geological Conservation;
- Planning and Pollution Control; and
- Development and Flood Risk.

Relevant topics that consistently occur within the above mentioned NPPF are:

- Resilience to climate change;
- Conservation / biodiversity;
- Sustainable use of resources;
- Mitigation of flood risk and the use of Sustainable Drainage Systems (SuDS);
- Suitable infrastructure capacity; and
- Protection of groundwater and freshwater.

3.1.1.2 Flood and Water Management Act 2010

The Flood and Water Management Act passed into statute in April 2010. It sets out a number of changes to the way that new development and water infrastructure will interact, including the proposed future mechanism for utilising SuDS where practical. SuDS assist in reducing the rates (and potentially volumes) of surface water arising from new developments and therefore reduce the impacts on the existing water cycle. This is important in ensuring that existing flood risks do not increase as a consequence of new developments, and can reduce (or even eliminate) the need to use existing sewerage systems to convey surface water. This reduces unnecessary expenditure in the uprating of existing sewers and WRC, reduces the probability of untreated discharges of wastewater during flood events, and can delay the requirement to consent increased flows from WRC.

3.1.2 Local

3.1.2.1 Uttlesford Local Plan

The Uttlesford Local Plan was adopted in 2005. It currently forms the basis for making planning decisions within the district alongside the National Planning Policy Framework published in March 2012 and the Planning Practice Guidance. UDC have identified that it is becoming increasingly out of date, therefore and a replacement plan is currently being prepared.

UDC have prepared a local development scheme (LDS) which forms the project plan for producing the new Local Plan. It has three main functions:

- To provide information on the documents the Council intends to prepare together with timescales for preparation.
- To establish the Council's priorities and to allow the Council to programme the work needed to prepare the new plans.
- To set out the timetable for the review of documents.

The Council last published a LDS in February 2016. However in October 2016 the Council took a decision to pause the formal decision making process. It is hoped that a new LDS will be published early in 2017.

3.2 Previous Water Cycle Studies

The Council has previously prepared a Stage 1 (Scoping and Outline Strategy) (2010) and Stage 2 (Detailed Strategy) (2012) WCS. The WCS is now out of date as it was prepared in relation to a previous Local Plan that did not proceed to adoption. However it did highlight that there were potential constraints to development related to sewer capacity or wastewater treatment in some areas, including Great Dunmow, Newport, Saffron Walden, Great Chesterford and Thaxted. A revised WCS will need to be completed when the current Local Plan is sufficiently advanced.

3.3 Water Resource Management Plan (WRMP)

Affinity Water is currently the sole statutory supplier of potable water to UDC and the entirety of the study area is located within the Central Supply Region. The Central Region abstracts 60% of the water supply from groundwater sources (with boreholes abstracting from chalk and gravel aquifers), 40% from surface water sources and imports from neighbouring water companies: (Thames Water, Anglian Water and Cambridge Water). Water is also exported from the Central Region to South East Water and Cambridge Water. The Central Region has an average Distribution Input of 840Ml/d.

The Central Supply Region is further subdivided into six water resource zones (WRZs) and these are broadly integrated areas in which customers are supplied by a common strategic pipe network from a number of local water sources. WRZs also allow water to be transferred between zones to enable operational flexibility and they are created as a strategic framework to facilitate assessment of the supply and demand. UDC is located within WRZ5 (Stort).

Sustainability reductions are reductions in source outputs agreed with the Environment Agency where water abstractions are considered to be having an impact on environmental habitats. Sustainability reductions result in closure of or reduction in abstraction at local water sources and subsequently investment is required in those areas to ensure demand is met.

Table 3: UDC Study Area WRZs

Water Resource Zones	Average Deployable Output Ml/d	Max Deployable Output Ml/d	Reason for change from 2009 WRMP
WRZ5 Stort	70.77	77.38	**Decrease**- Net reduction in abstraction licences.

Table 3 also details the deployable output for WRZ5 and the change from the output when compared to the 2009 WRMP that was used in the 2012 Uttlesford WCS. Deployable output (DO) is the term used to define how much water can be abstracted reliably from a source during a dry year and delivered into supply. It is measured in mega litres per day (Ml/d) and it is evaluated as an average DO over the whole year (known as average DO or ADO) and during critical periods (typically a seven-day period) when demands are at their highest (known as peak DO or PDO).

The previous WRMP (2009) assessed groundwater DO values based on 2005/06 groundwater levels, which were at their lowest during the dry year. Following another dry year in 2011/12 groundwater level data was reassessed as part of the 2014 WRMP, to see whether 2011/12 represented a more extreme case.

In general across the aquifers, the 2005/06 water levels were more extreme although at a few sources the 2011/12 levels were lower and the DO values were modified at these sources. Within the UDC study area this has resulted in a net decrease in abstraction licenses in WRZ5. This reduction in abstraction requires investment in those areas to ensure demand is met.

Affinity Water has arrangements with neighbouring water companies for the bulk supply import of treated water to WRZs. The volumes listed in Table 4 represent the available capacity, not the actual utilisation, which varies from year to year.

Table 4: UDC Study Area Existing Water Transfers

Water Resource Zones	Donating Company	Receiving Company	Av Ml/d	Max Ml/d
WRZ5 Stort	Cambridge Water	Affinity WRZ 5	0.31	0.31
	Essex and Southern Water		0.03	0.03

Increasing the volumes of water traded between water companies is a key Government initiative, designed to increase flexibility in supply systems and the efficiency with which available resources are used. It was also a key principle of the Water Resources in the South East (WRSE) project, which sought to provide a regional solution for the South East of England where the available resources were shared for the benefit of customers.

Affinity Water share boundaries with Anglian Water, Essex and Suffolk Water and Cambridge Water in the Central region at WRZ5. Affinity Water are currently undertaking the option appraisal for WRMP19 and, as part of this, they are meeting neighbouring water companies to understand potential water transfers. Any potential option will be subjected to a screening process according to Affinity Water's option appraisal methodology.

An assessment by Affinity Water concluded that the Central Regions does not have sufficient water for the whole of the 25-year planning period to meet customers' need for water. The baseline supply and demand assessments show that without the planned sustainability reductions, there are deficits in four of the water resource zones. However, with the planned sustainability reductions, five of the eight water resource zones

appear to be in deficit. The details of the predicted deficits in 2020 and 2040 are shown in Table 5. An increasing deficit is predicted in WRZ5 from 2020 onwards going beyond 10 Ml/d by 2014. At the end of the planning period, the total deficit for the whole company is forecast to be 170.04 Ml/d.

Table 5: Central Region Estimated Deficit (WRZ5 only)

Water Resource Zones	2020 Deficit Ml/d	2040 Deficit Ml/d
WRZ5 Stort	1 - 10	>10

3.3.1 Water Demand

The impact on water resources and infrastructure as a result of new development within the Uttlesford District does not solely depend upon the number of dwellings constructed. Demographic changes, i.e. changes in population and occupancy rates, will influence the impact of each new dwelling. Behavioural changes such as changes in per capita consumption (PCC), in both new and existing dwellings, will also affect the impact that the development has on the water infrastructure.

3.3.2 Water Balance Conclusions

Affinity Water have concluded there is not enough water to meet demand in all of the operating areas, and therefore an options appraisal has been undertaken to consider ways to resolve the deficits. Feasible options to balance supply and demand included schemes to reduce leakage, a universal metering programme and water efficiency measures. These are consistent with Government aspirations to reduce per capita water consumption. Affinity Water has also identified possible schemes to provide additional water resources from groundwater, surface water and transfers from neighbouring water companies and third parties within and in close proximity to their boundaries. Affinity Water have balanced supply and demand with a combination of options that have been identified through modelling and then validated through customer consultation. The options identified for WRZ5 are described below.

3.3.2.1 Options within WRZ5

- Leakage reduction by ALC option deriving a total of 3.5Ml/d over the planning period;
- Universal metering and water efficiency;
- Sources optimisation; and
- Water audits commercial.

3.4 Catchment Management Abstraction Strategy (CAMS)

The EA monitors existing abstractions so as to understand the water balance within catchments and what water may be available for future use. The EA prepares Catchment Abstraction Management Plans (CAMS) to make sure there is enough water for people and the environment. The results of the CAMS process are published in abstraction licensing strategies.

CAMS assess the amount of water available in each river catchment and review all abstraction licenses to determine whether or not they are having an unsustainable impact on the environment. The CAMS help to identify where water may be available for future use but also where water resource demands may be impacting the water balance and no further water is available for abstraction.

There are four main strategies which cover UDC study area and the details are contained within Table 6.

Table 6: Catchment Abstraction Management Plans

CAMS catchment	WRMU reference	Uttlesford Rivers Affected	Resource Availability Status
Cam and Ely Ouse	A: (Cam, Rhee and Granta)	Cam and tributaries, Granta (River Bourn near Ashdon)	Surface Water- restricted water available for licensing during high flows. No water available for licensing during moderate to low flow. Groundwater- not available for licensing. Overall consumptive abstraction available is less than 30% of the time.
Combined Essex	1: Pant/Blackwater, Ter, Roman/Layer, Wid, Brain, Chelmer	Pant, Ter and Chelmer	Surface Water and Groundwater- No water available for licensing.
Roding, Beam and Ingrebourne	2: Upper Roding	Roding	Surface Water - No water available for licensing. Overall consumptive abstraction available is less than 30% of the time.
Upper Lee	1: Rivers Lee, Mimram, Beane, Rib, Ash and Upper Stort	Stort	Surface Water and Groundwater- No water available for licensing. Overall consumptive abstraction available is less than 30% of the time.
	2: River Stort and Pincey Brook	Stort, Pincey Brook, Stansted Brook	

The CAMS indicate that overall no further consumptive licences will be granted for groundwater or surface water sources. There is no further water for abstraction as overall further abstraction would result in an unsustainable impact on the environment. Water may be available to 'buy' (known as licence trading) the entitlement to abstract water from an existing licence holder.

In summary, with no further licences being granted within the majority of UDC water efficiency measures relating to the existing supply will need to be implemented to safeguard water supplies into the future. Further sustainability reductions may be required in the future to support the aspirations of the Water Framework Directive (WFD). Development of additional resources, or increased efficiency through demand management, will be required to maintain the supply required for new developments.

3.5 River Basin Management Plan (RBMP)

River Basin Management Plans (RBMP) have been developed by the various regional offices of the Environment Agency and were published in 2009 and updated in 2014. The RBMPs set out a strategy, including a Programme of Measures, for each catchment to comply with the requirements of the WFD. An assessment of the current status of the rivers has be made, showing the rivers and lakes that currently fall below the 'good' status required to meet the WFD. The documents then set out those rivers that should be at 'good' status by 2027. As with the CAMS designations, Uttlesford District falls within the Thames and Anglian RBMP areas. Further information on the WFD, the current status, and future targets of the District's watercourses is included in Table 7.

Table 7: RMBP Summary

Catchment	Sub Catchment	River Reach	RMBP Cycle 2 2015			
			Overall Status	Ecological Status	Chemical Status	Objectives
Cam and Ely Ouse	Cam, Rhee and Granta	Cam (Audley End to Stapleford)	Poor	Poor	Good	Moderate by 2027
		Wenden Brook	Good	Good	Good	Good by 2015
		Slade	Poor	Poor	Good	Poor by 2015
		Cam (Newport to Audley End)	Moderate	Moderate	Good	Good by 2027
		Wicken Water	Moderate	Moderate	Good	Good by 2015
		Cam (Upstream of Newport)	Poor	Poor	Good	Good by 2027
		Debden Water	Moderate	Moderate	Good	Good by 2027
Combined Essex	Chelmer	Great Easton to River Can	Moderate	Moderate	Good	Moderate by 2015
		Upstream of Great Easton	Moderate	Moderate	Good	Good by 2027
		Stebbing Brook	Good	Good	Good	Good by 2015
		Can	Poor	Poor	Good	Good by 2021

Thames	Upper Roding	To Cripsey Brook	Poor	Poor	Good	Poor by 2015
	Upper Lee	Stansted Brook	Bad	Bad	Good	Good by 2027
		Pincey Brook	Moderate	Moderate	Good	Moderate by 2015
		Great Hallingbury Brook	Moderate	Moderate	Good	Moderate by 2015
		Stort at Clavering	Moderate	Moderate	Good	Moderate by 2015

Reviewing the RBMPs reveals that, with the exception of Stebbing Brook, and Wenden Brook, all of the main watercourses within the District **cannot currently achieve 'good' status (or GEP)** in the above timescales.

According to the RBMPs, throughout the District the main barriers to achieving 'good' status are:

- Sewage Discharge
- Groundwater abstraction
- Impoundments
- Urbanisation
- Barriers to fish migration
- Excessive Phosphate concentrations;
- Low Dissolved Oxygen concentrations;
- Low Fish and Invertebrate population levels;
- Unfavourable ratios between nutrient sensitive and nutrient tolerant species of Phytobenthos (microscopic plant life residing on the river bed); and
- Failure to adequately mitigate the impacts of modification (which is preventing the majority of the HMWB in the District achieving GEP).

Discharges from WRC and industry, and surface water runoff (in particular from agricultural areas) can lead to nutrient enrichment, or eutrophication, of the receiving watercourses. High levels of nutrients such as phosphorous or nitrates can encourage excessive algal growth. This can adversely affect the biodiversity of the watercourse, particularly as it decreases the oxygen levels in the water that other life forms depend upon.

The key development site locations within each river catchment are detailed below:

- **Cam and Ely Ouse**- Saffron Walden, Newport and Great Chesterford
- **Thames**- Elsenham, Takeley, Stansted andLittle Easton
- **Combined Essex**- Thaxted, Great Dunmow and Great Easton, Felsted, Stebbing

The major impact of the potential development sites on the water environment will be the variations in water quality and quantity discharged to receiving watercourses from the site itself (surface water runoff) and the WRC that serve the sites. Water discharged from the sites will require careful management to ensure that the development does not have a detrimental impact on the water environment.

3.6 Surface Water Management Plan (SWMP)

Surface Water Management Plans (SWMPs) outline the preferred surface water management strategy in a given location. SWMPs are undertaken, when required, by Lead Local Flood Authority (LLFAs) in consultation with key local partners who are responsible for surface water management and drainage in their area. SWMPs establish a long term action plan to manage surface water in a particular area and are intended to influence future capital investment, drainage maintenance, public engagement and understanding, land-use planning, emergency planning and future developments.

There are currently no SWMPs covering Uttlesford District. Saffron Walden has been identified by Essex County Council as a Tier 2 area, to be completed in the future. Clavering, Great Dunmow, Takeley, Thaxted and Stansted Mountfitchet have been identified as Tier 3 areas. Any future SWMPs carried out for these areas must be considered by the future review of Local Plan process.

3.7 Catchment Flood Management Plan (CFMP)

Catchment Flood Management Plans (CFMP) are high level policy documents covering large river basin catchments prepared by the Environment Agency. They aim to set policies for sustainable flood risk management for the whole catchment covering the next 50 to 100 years.

Uttlesford is part of three different CFMP areas: the Great Ouse (CFMP7), the Thames (CFMP8) and the North Essex (CFMP9). CFMPs split their catchments into sub areas with similar flood risk management types and assign one of six policies to each sub area. Table 8 summarises the policy statements relating to Uttlesford District for each CFMP.

Table 8: CFMP Summary For Uttlesford Study Area

CFMP	Sub Area	Policy
Great Ouse	Bedford Ouse rural and eastern rivers	Policy 3- Areas of low to moderate flood risk where we are generally managing existing flood risk effectively.
Thames	Towns and villages in open floodplain (north and west)	Policy 6- Areas of low to moderate flood risk where we will take action with others to store water or manage runoff in locations that provide overall flood risk reduction or environmental benefits.
North Essex	Blackwater and Chelmer, upper reaches and coastal streams	Policy 2- Areas of low to moderate flood risk where we can generally reduce flood management actions.

Action and objectives are then identified for each sub area based on the policy assigned. These actions have been summarised in Table 9. Despite the different policies, all areas have been identified as rural areas of low to moderate risk and therefore there are some common themes in the proposed actions, most notably the need to work with Local Planning Authorities (LPAs) to ensure that floodplain is protected from development, and to maintain or improve local flood warning services.

Table 9: CFMP Policy Summary For Uttlesford Study Area

CFMP	Policy	Actions
Great Ouse	Policy 3	Investigate opportunities to reduce levels of flood risk management on Main Rivers. Continue with current levels of flood risk management on Ordinary Watercourses. Improve flood warning service

CFMP	Policy	Actions
		Work with partners to develop emergency response plans for critical infrastructure/ transport. Take opportunities to use mineral extraction sites to store water. Investigate land use change. Develop environmental enhancement projects to improve river state/ habitats
Thames	Policy 6	Maintain existing capacity of the system Identify locations where storage of water could benefit communities Work with LPAs to retain the floodplain for flood storage and adapt the urban environment to flood risk Continue flood warning service Help local communities manage flood risk (e.g. flood resilience)
North Essex	Policy 2	Reduce flood risk management activities e.g. channel maintenance Investigate land use change Work with LPAs to reduce the number of properties in the floodplain. Continue flood warning service and maintain flood warning infrastructure Work with partners to develop emergency response plans for critical infrastructure/transport.

Many of the actions proposed across all CFMPs relevant to the Uttlesford District area centre around changing behaviour of communities rather than investment in hard engineering, however a number of improvements to existing surface water drainage systems in the urban areas will be required ensure suitable and reliable flow paths exist for effectively draining the development areas without increasing flood risk elsewhere.

3.8 Strategic Flood Risk Assessment (SFRA)

A Strategic Flood Risk Assessment (SFRA) for Uttlesford District Council (JBA, 2008) was completed in 2008. Since that time there have been significant changes to legislation relating to both flood risk and planning policy and therefore an updated SFRA was completed in May 2016 (JBA, 2016).

The SFRA identified that many of the settlements across Uttlesford have experienced flooding in the past, including (but not limited to), Debden, Elsenham, Great Chesterford, Great Dunmow, Newport, Saffron Walden, Stansted Mountfitchet, Stebbing, Takeley and Thaxted. Sources of past flooding have been predominantly from main rivers, ordinary watercourses and surface water.

Uttlesford is located in the headwaters of three major catchments (Great Ouse, North Essex and Thames). Fluvial floodplains tend to be well-defined and limited in extent by the topography. The majority of the main rivers have hydraulic models from the Environment Agency and flood risk is well understood in the main settlements. The exacerbation of flood risk by poorly maintained or blocked culverts in the District, particularly in Saffron Walden, continues to be an issue for the Environment Agency and LLFA, Essex County Council.

Local sources of flooding, particularly from ordinary watercourses and surface water, are also a problem in the District. Saffron Walden has been identified as a Tier 2 area of local flood risk by the LLFA due to its surface water risk and flood history, and Great Dunmow, Takeley, Thaxted and Stansted Mountfitchet have been identified as Tier 3 areas. Groundwater and sewer flooding are limited and very localised.

4 Methodology and Assumptions

The following section lists the methodology and assumptions applied to the WCS update.

4.1 Draft Development Trajectory

The current Uttlesford Local Plan was adopted in 2005. It currently forms the basis for making planning decisions within the District alongside the National Planning Policy Framework published in March 2012 and the Planning Practice Guidance. UDC have identified that it is becoming increasingly out of date, therefore and a replacement plan is currently being prepared.

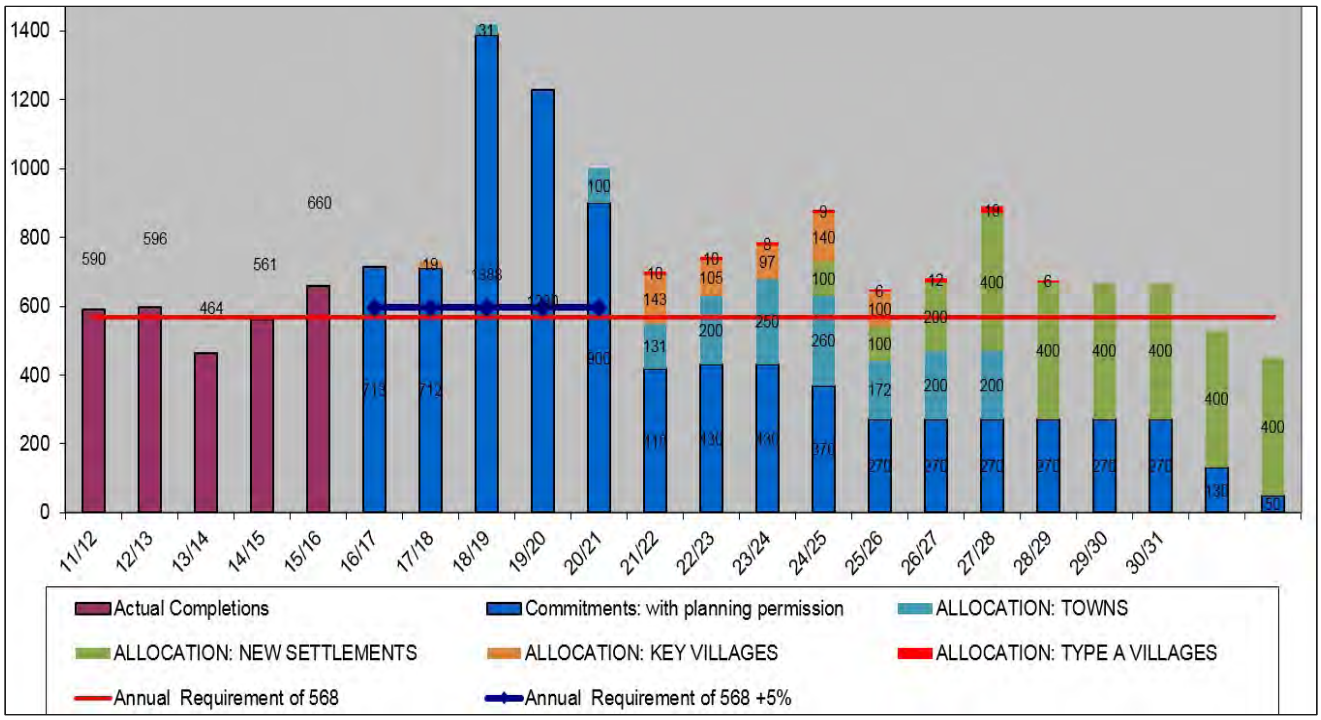
To inform the Local Plan and other studies, UDC has made an initial consideration of the Department for Communities and Local Government (DCLG's) household projections published 2012. Between 2011 and 2033 the projections estimate an average annual increase of 568 dwellings per year within the Uttlesford District.

Within this update an assessment of a single draft housing trajectory is undertaken. A breakdown of the development trajectory considered in this assessment is detailed in Table 10 and Figure 3.

Table 10: Development Trajectory

LOCATION	*Total (from 2017 to 2033)*
ALLOCATION TYPE: NEW SETTLEMENTS Two locations to be confirmed by UDC from the list below for the WCS Update as further explained below: • Elsenham • Great Chesterford • Little Easton • Stebbing	**2,800**
ALLOCATION TYPE: TOWNS • Great Dunmow • Saffron Walden	**1,544**
ALLOCATION TYPE: KEY VILLAGES • Thaxted • Takely • Stansted • Newport • Little Canfield	**604**
TOTAL	**4,948**

Figure 3: Housing Completions and Draft Trajectory 2011 to 2033



4.1.1 Occupancy Rates

To assess the impact of the proposed development within the District on the water infrastructure, an estimate of the predicted population and dwellings amounts, and hence occupancy rate, is required. It was agreed at the Stakeholder teleconference on the 14.10.2016 that an average Occupancy Rate of 2.35 should be adopted as a constant occupancy rate for calculations in the detailed WCS based on UDC supplied data. This occupancy rate will ensure a conservative estimate of the impacts on the water infrastructure and wider water environment.

4.1.2 New Settlement Sites

The housing trajectory provided by UDC allows for the provision of two new settlement sites and the location for the new settlement sites are being assessed at the following locations.

- Elsenham
- Great Chesterford
- Little Easton
- Stebbing

Out of the sites listed above the Local Plan may include one or more sites for new settlements. For the purpose of this study it assumes two sites and each site having a total allocation of 1,400 dwellings.

4.1.3 Non Residential Sites and Type A Villages

Non-residential sites have not been included in the WCS update. The approach has been taken to not include the employment sites within the WCS assessments as an assumption has been made that workers will mostly be included within the population estimations from within the residential development trajectory above.

Due to the small scale development within the Type A villages, these locations have been omitted from the WCS update.

5 Water Resources and Supply

Potable water is supplied to Uttlesford District via the AW trunk main network, localised groundwater and water transfers with neighbouring water companies. The District contains nine borehole pumping station locations. These are all groundwater sources, with treatment carried out at source before being put into supply.

As identified in Section 3 the entirety of Uttlesford District is supplied by Affinity Water and is located in WRZ5 as identified in the 2014 WRMP. AW identified a number of strategic options for WRZ5, these include leakage reduction, universal metering and water efficiency measures. The current WRMP includes an indicative dwelling forecast for up to 2040. It has made allowances for a 30% increase in dwellings by 2040 in WRZ5, the current UDC development trajectories provide an increase of approximately 35% in the UDC study area from 2014 figures by 2032 slightly exceeding the expectations of Affinity.

AW has provided outline details of its preferred strategy for delivering water within WRZ over the 25 years, these strategy includes measures as follows:

- Distribution network leakage reduction
- Universal metering through automated meter reading
- Household water efficiency measures implementation
- Increases to existing licences where sustainable
- Water transfers from neighbouring water companies

A detailed timeline is shown below in Table 11:

Table 11: Affinity Water WRZ5 Preferred Options Timeline.

Option Type	Option Name	WRMP Delivery Year
Metering	Metering: community integrated AMR & water efficiency	2015
Water Efficiency	Water audits Commercials (non-process)	2015
Water Efficiency	Water audits Commercials (process)	2015
Supply	Increase licence in Stansted	2016
Supply	Source optimisation in Hempstead	2018
Supply	Source optimisation in Widford	2018
Water Efficiency	Additional Water Efficiency for households	2033
Water Efficiency	Airport water efficiency - Stansted	2039

5.1 Development Impacts

In order to assess the developing trajectory's impact on water demand the following equation was used:

Total District Demand Change in demand from existing dwellings + new dwelling demand

Where demand from new and existing dwellings is calculated from:

Number of dwellings * occupancy rate * Per capita Consumption (PCC)

The above methodology requires a number of assumptions:

- Water distribution leakage values have been discounted from the calculation;
- Non-residential and employment sites have also been discounted as per best practice for WCSs to avoid double counting; and
- Occupancy has been assumed to remain at a flat rate of 2.35 for new and existing dwellings across the assessment period.

5.1.1 Demand Projection Scenarios

Three potable water demand scenarios, dependant on Per Capita Consumption (PCC) projections have been developed in consultation with UDC and AW:

Table 12: Demand Scenarios

Scenario	PCC of Existing Dwellings	PCC of New Dwellings
Best Case	161.95-143.17 l/p/d. As per Affinity's preferred option NYAA PCC rates as detailed in the 2014 WRMP.	105 l/p/d – In line with DEFRA's requirements for social housing.
Preferred Business Case	161.95-143.17 l/p/d. As per Affinity's preferred option NYAA PCC rates as detailed in the 2014 WRMP.	110 l/p/d – As defined by Building Regulations optional requirements.
Worst Case	161.95-152.46 l/p/d. As per Affinity's baseline option NYAA PCC rates as detailed in the 2014 WRMP.	125 l/p/d – As defined by Building Regulations minimum requirements.

The full projected PCC rates are provided in Appendix B.

5.1.2 Demand Projection Results

The demand projection results for Uttlesford District are shown in Figure 4 below. This includes likely water demand from the existing dwellings and planning commitments as well as the new dwellings.

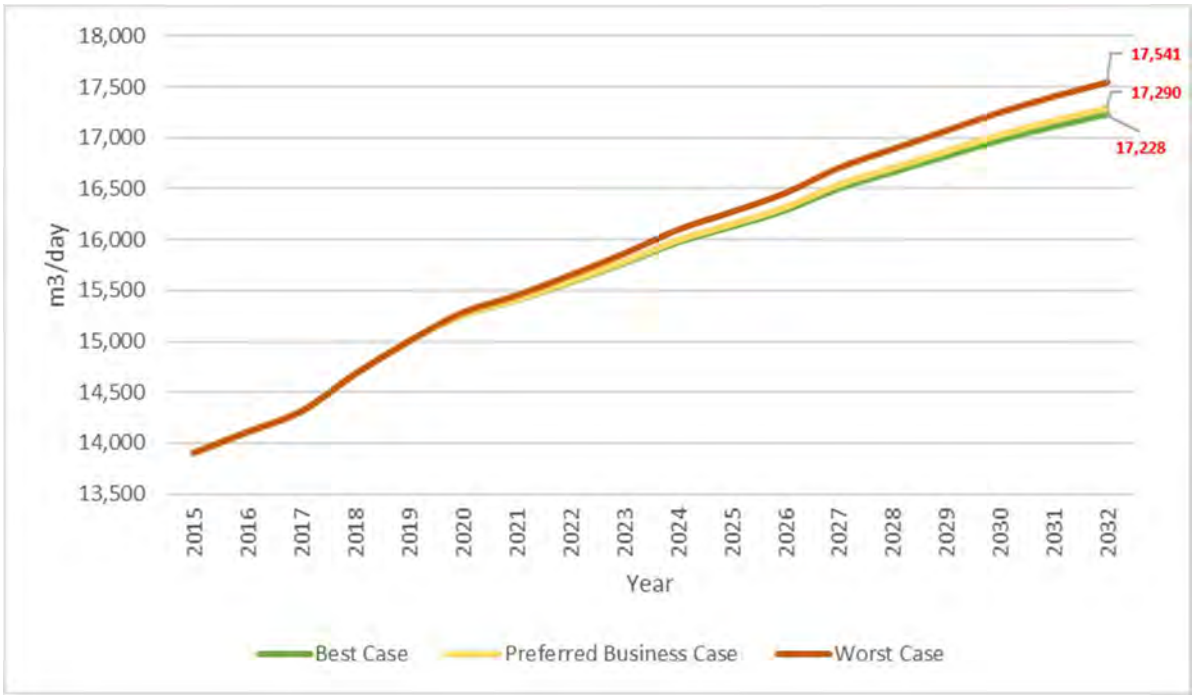


Figure 4: Uttlesford District Demand Projections 2015-2032 (Final 2032 figures shown in red).

The projections show that there is limited variation between scenarios with a final difference of 313m^3/day between best and worst case scenarios by 2032. This is due to these figures being mainly influenced by the demand from the existing dwellings. The below table provides an overview of the increase to existing water consumption within the District from both the new housing and existing planning commitments.

Table 13: Uttlesford District Extra Water Demand Summary (when compared with 2015 baseline).

Scenario	2032 Increase in Demand (m3/day)	Change in Demand
Best Case	3,330	+23.96%
Preferred Business Case	3,391	+24.40%
Worst Case	3,643	+26.21%

5.2 Opportunities and Constraints

The WCS outputs provide the following in terms of opportunities and constraints for water resources and supply within the catchment.

5.2.1 Opportunities

- Implementation of the optional Building Regulations water usage values of 110 l/p/day in order to exemplar efficiency and minimise water demand impact in a water stressed area;
- Provision of mandatory infiltration SuDS requirements for new development where ground is permeable in order to aid groundwater recharge on which the District relies. Water-reuse is also encouraged to reduce extra water demand;
- Encourage community engagement and awareness regarding water efficiency and water usage.

5.2.2 Constraints

- The currently proposed development trajectory is likely to slightly exceed the forecasted numbers generated by Affinity Water as part of their 2014 WRMP, immediate consultation with Affinity Water is required to address any implications. Affinity Water is updating its population and property forecast as part of WRMP19;
- For new settlements substantial new water supply infrastructure will be required to serve, it is recommended that site specific assessments are undertaken as part of the development planning process to cover the detailed requirements of these sites with early engagement with Affinity Water;
- Whilst no more sustainability reductions to the current water abstractions are thought to be imposed by the EA, this may change in the future limiting the available deployable outputs in the District.

6 Wastewater Treatment and Sewerage

Wastewater treatment and conveyance within Uttlesford District is managed by both Anglian Water and Thames Water, an overview map of wastewater collection and treatment assets is provided in Figure 5 below.

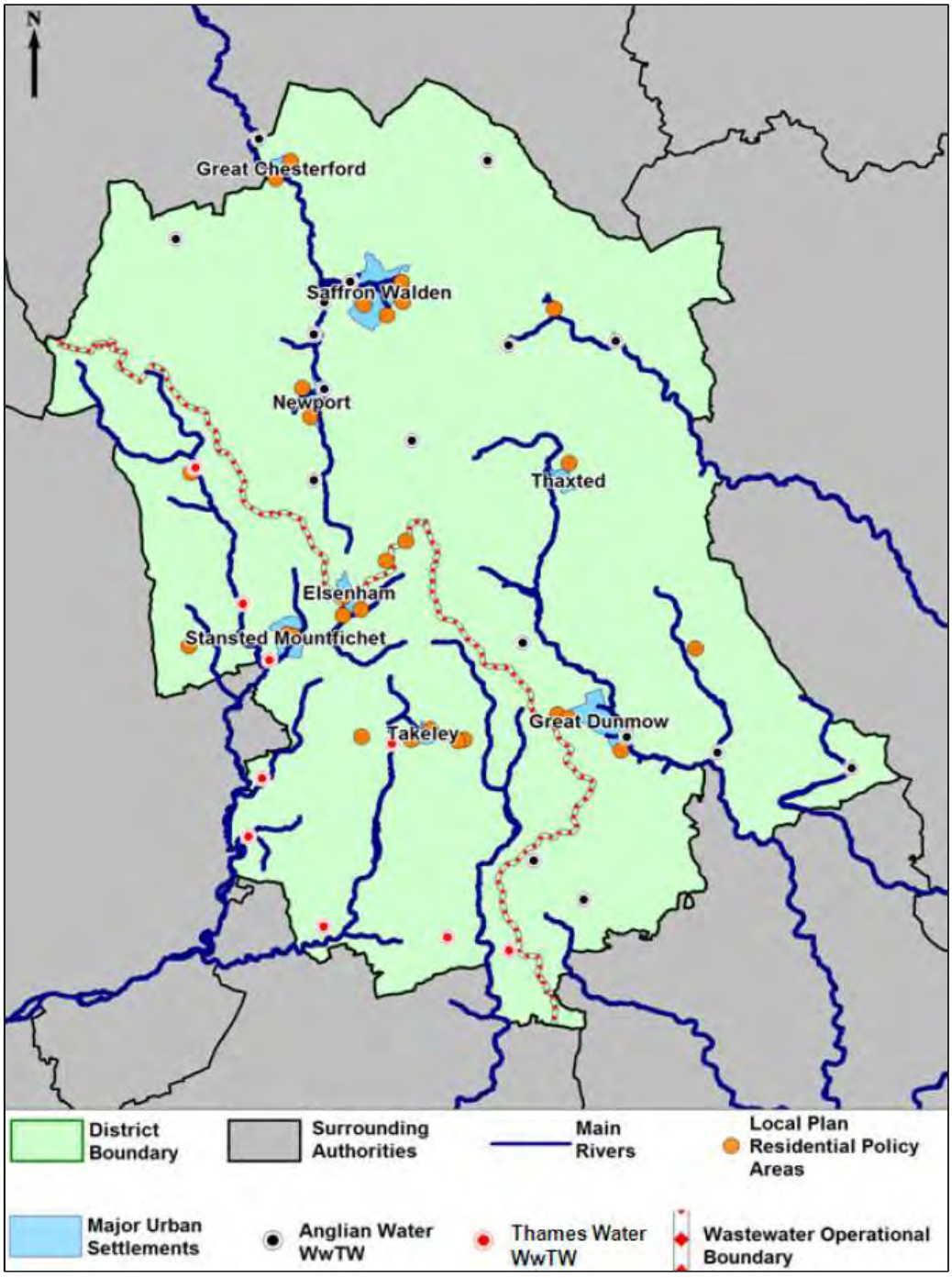


Figure 5: Wastewater collection and treatment assets

Since the publication of the 2012 Detailed WCS the proposed development trajectory has been modified by UDC, this along with any changes or upgrades to Anglian Water and Thames Water assets has necessitated an update to the previous WCS. Consultation with both Anglian Water and Thames Water has been taken place to inform this WCS with key correspondence provided in Appendix A.

In order to confirm the impact of the proposed residential development, the following aspects have been assessed as part of this WCS update:

- Impact of development trajectory on volumetric discharge in terms of Dry Weather Flow (DWF) in relation to existing discharge consents;
- Identification of WRCs which require upgrading or where upgrades are not feasible, identification of potentials for new WRCs;
- Identification of key wastewater constraints in relation to each site considered within UDCs proposed development trajectory;
- Commentary on the sewerage network constraints; and
- Recommendations for future detailed studies.

6.1 Wastewater Treatment Projections

The 2012 Detailed WCS concluded that there were constraints across a number of key existing settlements, these included: Saffron Weldon, Great Dunmow, Newport and Felsted. The methodology used previously has been re-applied using the latest variables as below:

$$\text{Total DWF} \quad \text{Existing DWF} + \text{New DWF}$$

Where

$$\text{DWF} \quad (\text{number of dwellings} \times \text{occupancy rate} \times \text{PCC}) + \text{I infiltration} + \text{trade flow}$$

Following consultation with Anglian and Thames Water, the PCC rate used is 131 l/p/d. This is lower than the 144 l/p/d used in the 2012 Detailed WCS, however is still above the maximum requirement for Building Regulations (125 l/p/d). The allowance for infiltration, which accounts for water entering the sewerage network from incorrect or illegal connections, and through defects in the existing assets, is estimated to be an additional 25% of the DWF from dwellings, based on guidance from Anglian and Thames Water. Occupancy rates have been set at 2.35 as per Anglian Water guidance.

It has been assumed that trade effluent remains constant for the foreseeable future across the District. Intensification of existing employment areas is unlikely to result in a net increase in industrial demand, as it is predicted that existing companies with heavy water use will improve efficiency, and be replaced with service-orientated industry over time.

Initial high level discussions with Anglian Water engineers and planners, based on their knowledge of current capacity and performance at the WRCs have been undertaken to assess the potential impact from the proposed development. Where Anglian Water estimate that upgrades will be required, the feasibility of such upgrades, has been briefly outlined below.

For the purpose of the initial calculations, dwellings outlined within the proposed development trajectory (including existing and committed development) have been assigned to a WRC dependant on the catchment in which they are located in, as summarised in Table 14 below. It should be noted however that for the WCS calculations that the following dwellings have not been included:

- Small sites (<6 dwellings) with existing planning permission;
- Sites with existing planning permission which are in a WRC catchment not impacted by the proposed draft trajectory;
- Windfall allocations;
- Sites located in ‘Type A’ villages.

6.2 Catchment Overview

The table below details the development overview in relation to the WRC catchments. The majority of catchments will be impacted by development in the Towns and Key Villages, whereas some catchments (Felsted and Great Chesterford) could be impacted by New Settlement sites only. Stansted Mountfitchet and Bishop's Stortford WRCs that are within the Thames Water operational area could be impacted by New Settlements in addition to Towns and Key Villages.

Table 14: Catchment and development overview

Water Company	Water Recycling Centre	Communities Served	Proposed Development
Anglian Water	Saffron Walden	Saffron Walden	Development in Towns and Key Villages
	Newport	Newport	Development in Towns and Key Villages
	Great Dunmow	Great Dunmow	Development in Towns and Key Villages
	Great Easton	Thaxted	Development in Towns and Key Villages
	Great Chesterford	Great Chesterford	Potential location for new settlement site (1,400 dwellings up to 2032)
	Felsted	Stebbing	Potential location for new settlement site (1,400 dwellings up to 2032)
Thames Water	Stansted Mountfitchet	Elsenham	Development in Towns and Key Villages Potential location for new settlement site (1,400 dwellings up to 2032)
		Stansted Mountfitchet	Development in Towns and Key Villages
	Bishop's Stortford	Takeley	Development in Towns and Key Villages
		Little Canfield	Development in Towns and Key Villages
		Little Easton	Potential location for new settlement site (1,400 dwellings up to 2032)

The impacts on the individual WRCs from development in Towns and Key Villages and from the potential New Settlements sites are discussed in Section 6.3 and 6.4 respectively.

6.3 Towns and Key Villages Impacts

Following consultation with both Anglian Water and Thames Water the assessment carried out within this study has used the most recent measured flows made available for the impacted WRCs as the current baseline. This method should provide a more accurate assessment of the actual impact of the development over a calculated baseline.

The following sections provide an overview of each WRC in the study area along with high-level calculations, commentary and recommendations in terms of wastewater treatment and conveyance.

6.3.1 Saffron Walden

Saffron Walden WRC is an Anglian Water asset located to the east of the town of Saffron Walden serving both the town and the village of Sewards End. The location of both the works and its associated sewer network are shown below in Figure 6. It currently serves an existing Population Estimate (PE) of 17,363 and has an existing DWF consent for 3,700 m^3/day.

Figure 6: Location Plan – Saffron Walden WRC catchment

The development numbers have been assessed as part of this WCS is shown in the table below with the full trajectory breakdown provided in Appendix C.

Table 15: Saffron Walden Development Breakdown

WRC	Development breakdown	Total number of dwellings (2016 2032)
Saffron Walden	Existing Commitments	569
	Draft Trajectory	753
	Total	**1322**

The trajectory has been applied to the measured baseline DWF supplied by Anglian Water using the methodology outlined above. Graphical results are shown in the figure below.

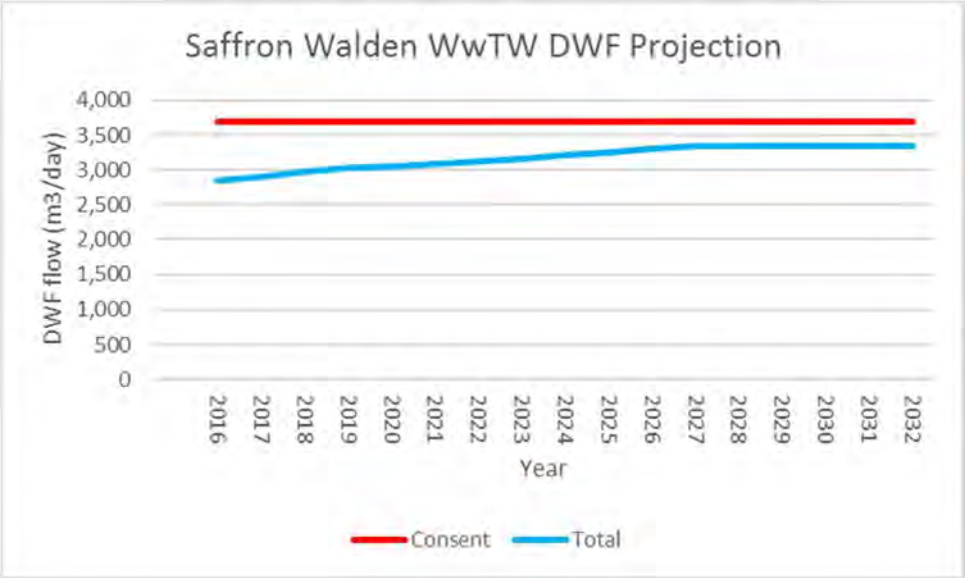


Figure 7: Saffron Walden WRC DWF Projection

The results show that the development trajectory is not expected to exceed the existing DWF consent during the study period. Following consultation with Anglian Water it can be confirmed that there are no major constraints to development in and around Saffron Walden in terms of wastewater treatment. Developers are recommended to engage with Anglian Water as early as possible during the planning process.

6.3.1.1 Sewerage Network

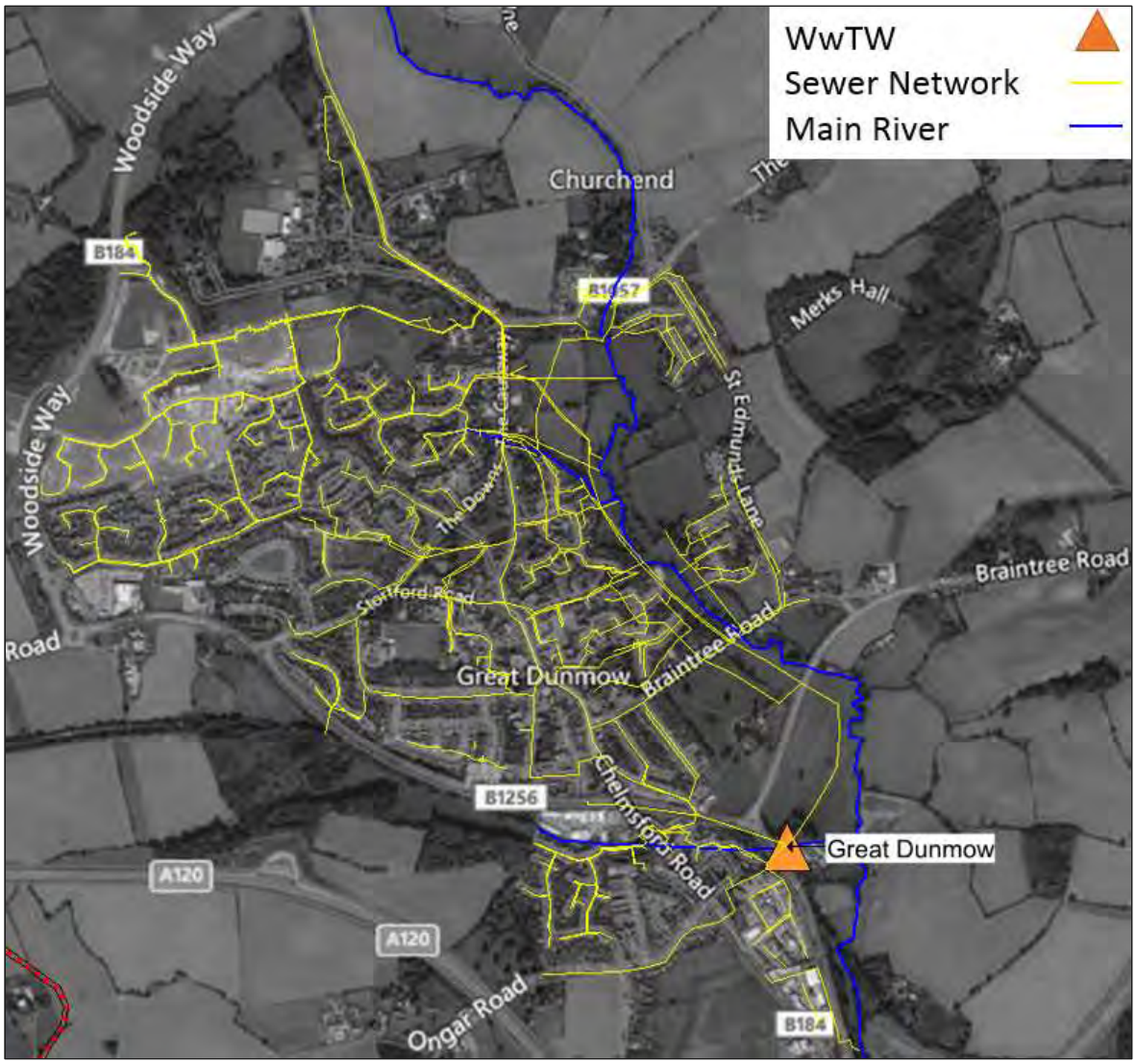
Following consultation with Anglian Water, no specific foul sewerage constraints were identified however the following points were highlighted:

- All new development sites will reduce the wastewater network capacity. Therefore, mitigation measures will be required to ensure flooding risk is not increased.
- Available capacity in Foul Water (FW) networks will be determined by more detailed analysis. For developments of greater than 10 properties it is assumed that some enhancement to capacity may be required.

6.3.2 Great Dunmow

Great Dunmow WRC is an Anglian Water asset located to the south of the town of Great Dunmow, north of the A120 serving just the town. The location of both the works and its associated sewer network are shown below in Figure 8. It currently serves an existing PE of 9,144 and has an existing DWF consent for 1,509 m^3/day.

Figure 8: Location Plan – Great Dunmow WRC Catchment



The development numbers have been assessed as part of this WCS is shown in the table below with the full trajectory breakdown provided in Appendix C.

Table 16: Great Dunmow Development Breakdown

WRC	Development breakdown	Total number of dwellings (2016 2032)
Great Dunmow	Existing Commitments	2,161
	Draft Trajectory	683
	Total	**2,844**

The trajectory has been applied to the measured DWF baseline supplied by Anglian Water using the methodology outlined above. Graphical results are shown in the figure below.

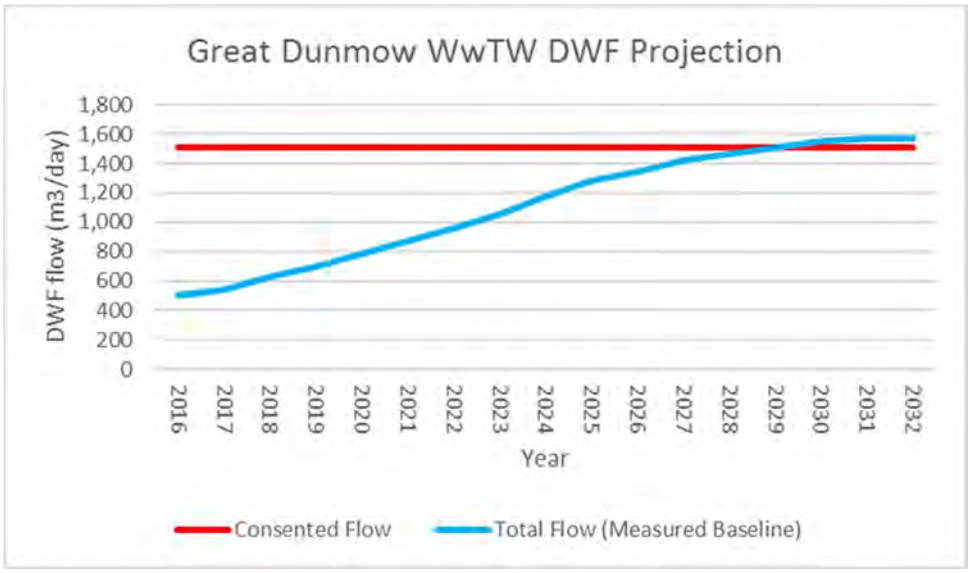


Figure 9: Great Dunmow WRC DWF Projection

The results show that the development trajectory will cause the DWF consent to be exceeded by 2029. The scale of exceedance is relatively small at 53 m^3/day so may be achievable through water efficiency improvements across the catchment. Following discussion with Anglian Water it should be highlighted that there is currently a diversion taking place from Great Dunmow transferring flow to Felsted as a temporary measure whilst upgrades take place. The future baseline could therefore be higher increasing the significance of consent exceedance subject to the future status of ongoing flow transfer to Felsted, which needs further monitoring.

Anglian Water has confirmed that Great Dunmow has adequate headroom capacity in terms of DWF consents to serve the proposed growth, following the completion of the current upgrade works, although this will subject to the future continuation of current flow transfer to Felsted as highlighted above.

6.3.2.1 Sewerage Network

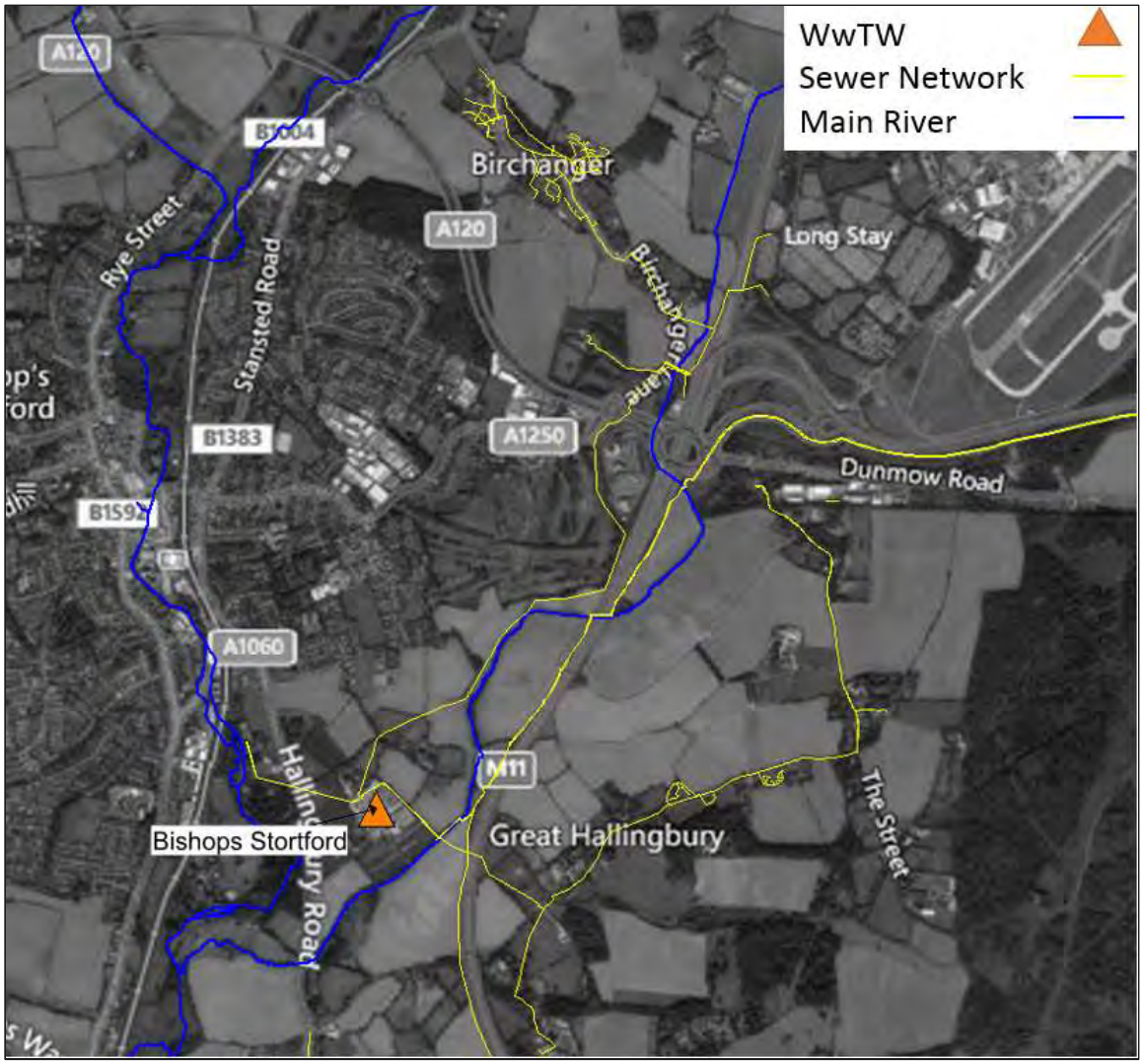
Following consultation with Anglian Water, no specific foul sewerage constraints were identified however the following points were provided:

- All new development sites will reduce the wastewater network capacity. Therefore, mitigation measures will be required to ensure flooding risk is not increased.
- Available capacity in FW networks will be determined by more detailed analysis. For developments of greater than 10 properties it is assumed that some enhancement to capacity may be required.

6.3.3 Bishop's Stortford

Bishop's Stortford WRC is a Thames Water asset located to the south east of the town of Bishop's Stortford, west of the M11 serving the town, Takeley, Birchanger and Stansted Airport. The location of both the works and its associated sewer network are shown below in Figure 10. It currently serves an existing PE of 53,800 and has an existing DWF consent for 17,349 m^3/day.

Figure 10: Location Plan – Bishop's Stortford WRC Catchment



The development numbers have been assessed as part of this WCS is shown in the table below with the full trajectory breakdown provided in Appendix C.

Table 17: Bishop's Stortford Development Breakdown

WRC	Development breakdown	Total number of dwellings (2016 2032)
Bishop's Stortford	Existing Commitments	12
	Draft Trajectory	240
	Total	**252**

The trajectory has been applied to the measured DWF baseline supplied by Thames Water using the methodology outlined above. Graphical results are shown in the figure below.

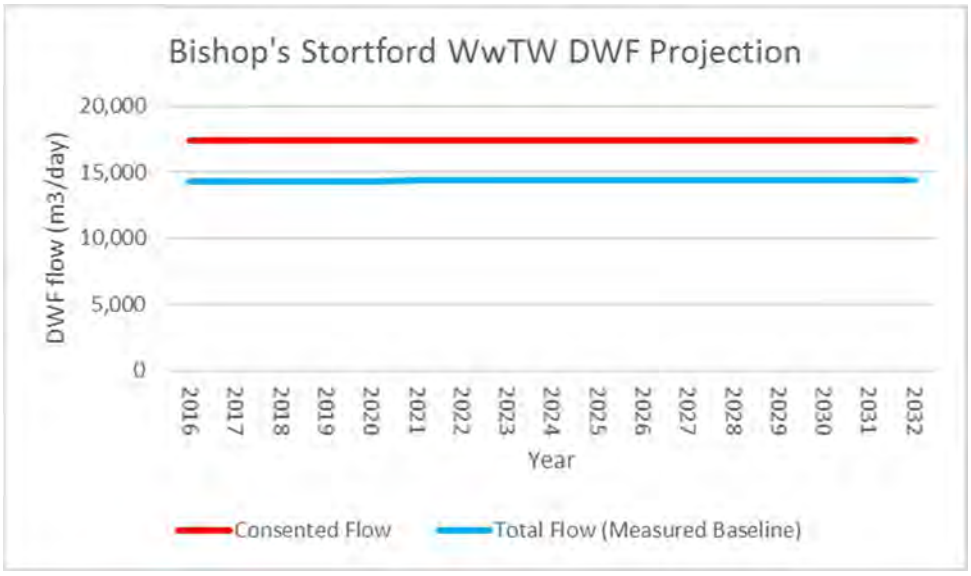


Figure 11: Bishop's Stortford WRC DWF Projection

The results show that the development trajectory is not expected to exceed the existing DWF consent during the study period. Following consultation with Thames Water they identified that a scheme aimed at improving discharge quality is currently underway is due for completion in early AMP7. They confirmed that the above development can be accommodated without upgrades however with consideration of the new settlements (discussed in Section 6.4 below) upgrades would be required.

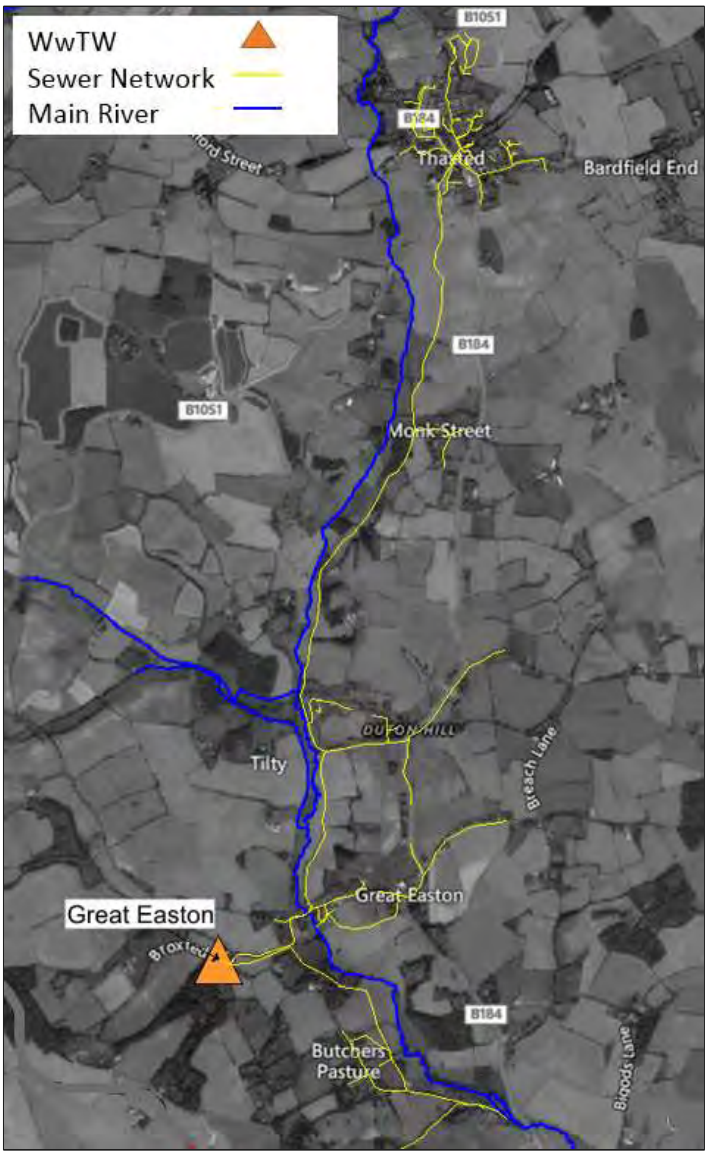
6.3.3.1 Sewerage Network

Following consultation with Thames Water they identified that minimum upgrades would be required to accommodate the development.

6.3.4 Great Easton

Great Easton WRC is an Anglian Water asset located to the west of the villages of Great Easton and Little Easton, and serving both villages. The location of both the works and its associated sewer network are shown below in Figure 12. It currently serves an existing PE of 3,714 and has an existing DWF consent for 720 m^3/day.

Figure 12: Location Plan – Great Easton WRC Catchment



The development numbers have been assessed as part of this WCS is shown in the table below with the full trajectory breakdown provided in Appendix C.

Table 18: Great Easton Development Breakdown

WRC	Development breakdown	Total number of dwellings (2016 2032)
Great Easton	Existing Commitments	219
	Draft Trajectory	12
	Total	**231**

The trajectory has been applied to the measured DWF baseline supplied by Anglian Water using the methodology outlined above. Graphical results are shown in the figure below.

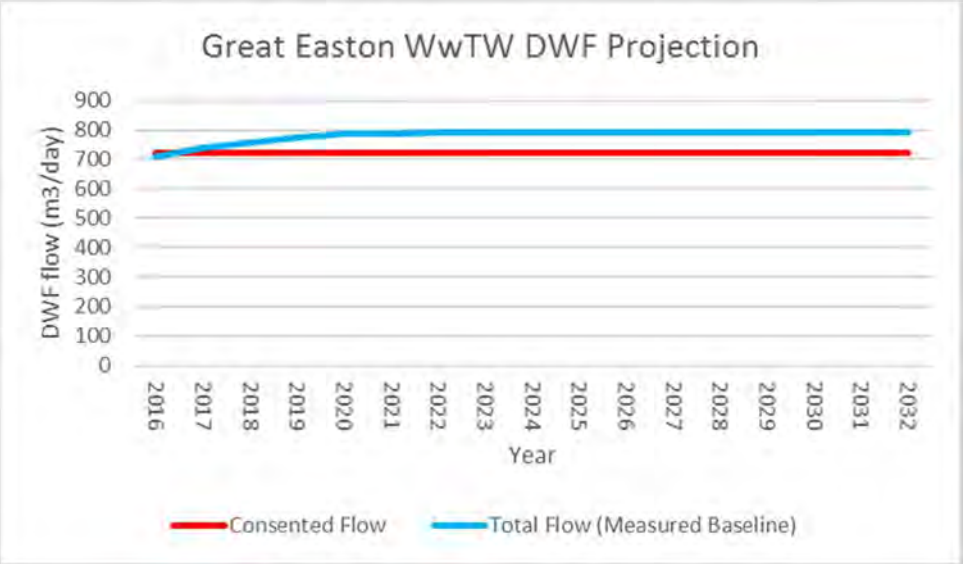


Figure 13: Great Easton WRC DWF Projection

The results show that the development trajectory is expected to exceed the existing DWF consent by the end of this year. Following consultation with Anglian Water they confirmed that the above development can be accommodated following upgrades to treatment process capacity. Developers are advised to contact Anglian Water as soon as possible in the planning process to ensure adequate capacity.

6.3.4.1 Sewerage Network

Following consultation with Anglian Water, no specific foul sewerage constraints were identified however the following points were provided:

- All new development sites will reduce the wastewater network capacity. Therefore, mitigation measures will be required to ensure flooding risk is not increased.
- Available capacity in FW networks will be determined by more detailed analysis. For developments of greater than 10 properties it is assumed that some enhancement to capacity may be required.

6.3.5 Newport

Newport WRC is an Anglian Water asset located to the east of the village of Newport and the rail line. It serves the Newport, Widdington, Wicken Bonhunt and Arkesden. The location of both the works and its associated sewer network are shown below in Figure 14. It currently serves an existing PE of 2,784 and has an existing DWF consent for 650 m^3/day.

Figure 14: Location Plan – Newport WRC Catchment

The development numbers have been assessed as part of this WCS is shown in the table below with the full trajectory breakdown provided in Appendix C.

Table 19: Newport Development Breakdown

WRC	Development breakdown	Total number of dwellings (2016 2032)
Newport	Existing Commitments	263
	Draft Trajectory	105
	Total	**368**

The trajectory has been applied to the measured DWF baseline supplied by Anglian Water using the methodology outlined above. Graphical results are shown in the figure below.

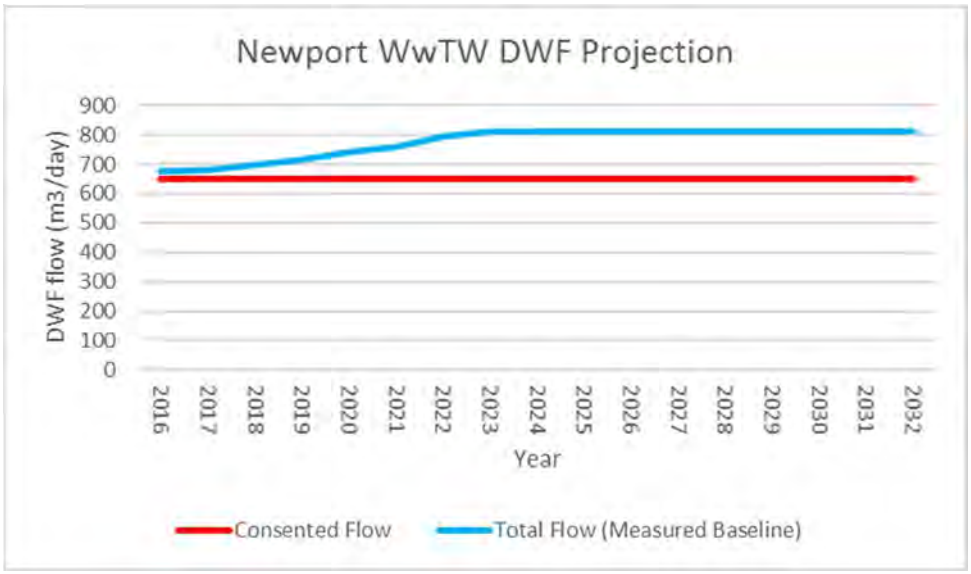


Figure 15: Newport WRC DWF Projection

The results show that the existing DWF consent is already exceeded. Following consultation with Anglian Water they confirmed that there are constraints to Newport and that significant upgrades would be required to accommodate the total trajectory. It should be noted that the existing committed developments alone are resulting in the capacity being exceeded. Developers are advised to contact Anglian Water as soon as possible in the planning process to ensure adequate capacity.

6.3.5.1 Sewerage Network

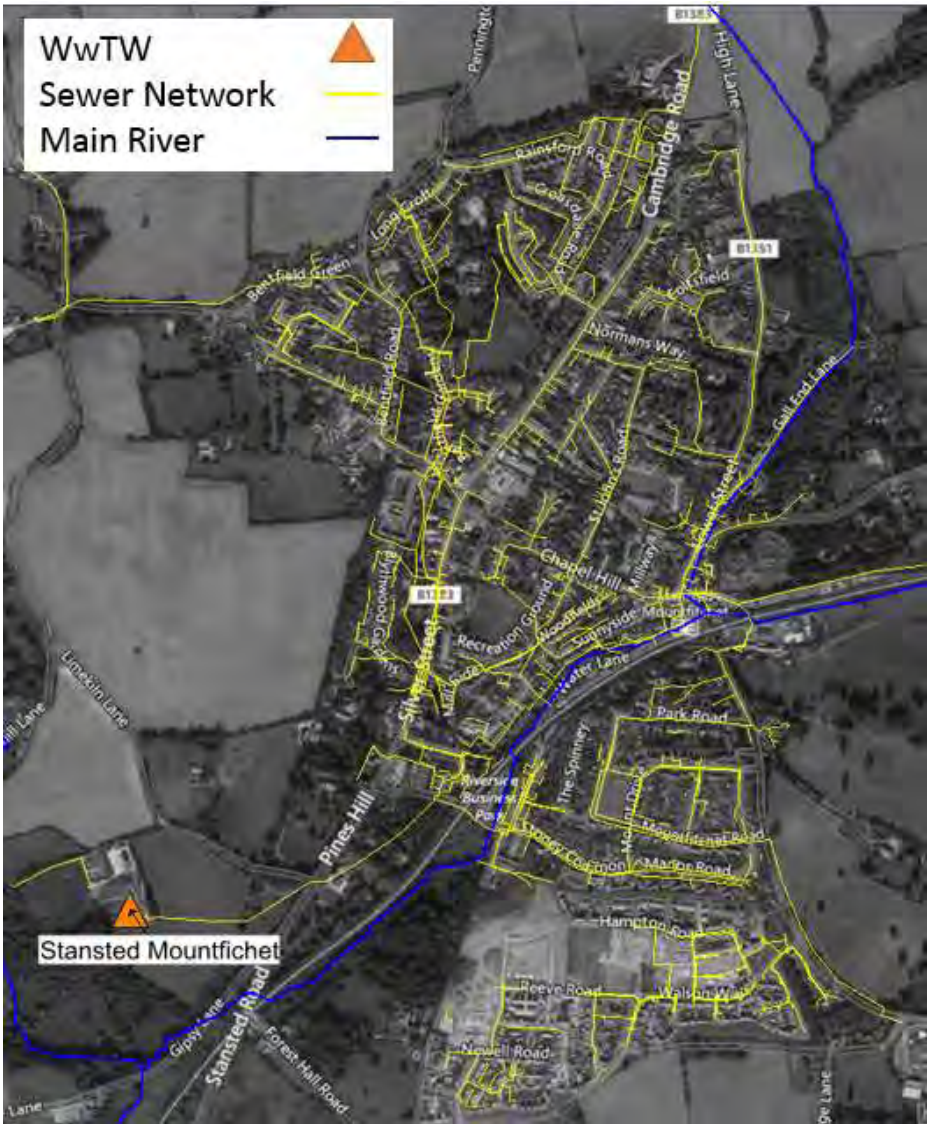
Following consultation with Anglian Water, no specific foul sewerage constraints were identified however the following points were provided:

- All new development sites will reduce the wastewater network capacity. Therefore, mitigation measures will be required to ensure flooding risk is not increased.
- Available capacity in FW networks will be determined by more detailed analysis. For developments of greater than 10 properties it is assumed that some enhancement to capacity may be required.

6.3.6 Stansted Mountfitchet

Stansted Mountfitchet WRC is a Thames Water asset located to the south west of the village of Stansted Mountfitchet. It serves the Stansted Mountfitchet, Elsenham, Ugley Green and Henham. The location of both the works and its associated sewer network are shown below in Figure 16. It currently serves an existing PE of 9,250 and has an existing DWF consent for 2,650 m^3/day.

Figure 16: Location Plan – Stansted Mountifitchet WRC Catchment



The development numbers have been assessed as part of this WCS is shown in the table below with the full trajectory breakdown provided in Appendix C.

Table 20: Stansted Mountfitchet Development Breakdown

WRC	Development breakdown	Total number of dwellings (2016 2032)
Stansted Mountfitchet	Existing Commitments	783
	Draft Trajectory	90
	Total	**873**

The trajectory has been applied to the measured DWF baseline supplied by Thames Water using the methodology outlined above. Graphical results are shown in the figure below.

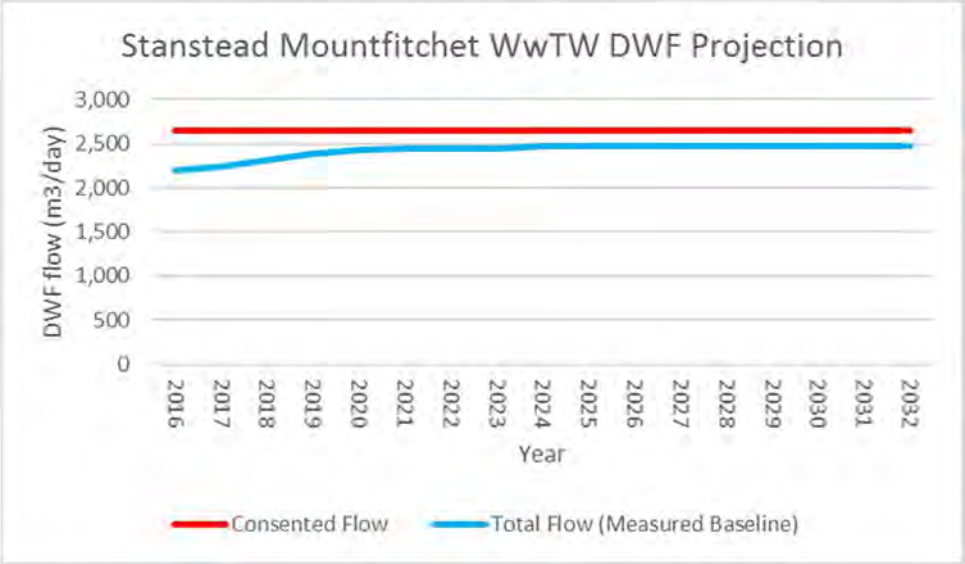


Figure 17: Stansted Mountfitchet WRC DWF Projection

The results show that the development trajectory is not expected to exceed the existing DWF consent during the study period. Following consultation with Thames Water they confirmed that the above development can be accommodated without upgrades however with consideration of the new settlements (discussed in Section 6.4 below) upgrades would be required.

6.3.6.1 Sewerage Network

Following consultation with Thames Water they identified that minimum upgrades would be required to accommodate the development.

6.3.7 Summary Red Amber Green (RAG) Table

A table summarising the key findings of the above assessment are detailed in Table 21 below. Red colouration indicates constraints within the WRC catchment, orange colouration indicates upgrades are required to accommodate the predicted growth and green indicates there are no significant issues and development can be accommodated within the catchment.

Table 21: Wastewater Summary RAG Table (excluding the impact of New Settlements)

WRC Catchment	Wastewater Treatment	Foul Sewerage Network
Saffron Walden	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Great Dunmow	There is capacity available to serve the development trajectory following upgrades.	Minimum upgrades required to accommodate development trajectory.
Bishop's Stortford	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Great Easton	Upgrades are required to the treatment process to be able to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Newport	Major upgrades are required to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Stansted Mountfitchet	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.

6.4 New Settlements

Given the scale of the new settlements, providing 1400 dwellings each within the plan period until 2032 and the multiple options for their siting, for the purpose of the wastewater treatment and conveyance assessment they have been assessed separately to the main trajectory above in this section whilst considering the cumulative development impacts in each impacted WRC catchment. Specific commentary and recommendations have been provided for the new settlements proposed as part of the emerging Local Plan. As detailed in Section 4.1.2 there are currently four potential sites for the new settlements, each of which falls within a different wastewater catchment as shown in Table 22.

Table 22: New Settlements Wastewater Catchments

New Settlement Site	Wastewater Catchment
Great Chesterford	Great Chesterford (Anglian Water)
Elsenham	Stansted Mountfitchet (Thames Water)
Little Easton	Bishop's Stortford (Thames Water)
Stebbing	Felsted (Anglian Water)

A high-level exercise has been undertaken to assess the impact of the new settlements. Where the WRC is already impacted from the development trajectory above these have been considered together in order to assess the full impact (See Table 23 below). The additional flows from the new settlements has been calculated in line with the methodology previously outlined in Section 6.

Table 23: New Settlements Wastewater DWF Calculation

Wastewater Catchment	Existing Consent (m^3/day)	2016 Measured DWF Flow (m^3/day)	Towns and Key Villages Development trajectory additional flow only (m^3/day)	Cumulative Flow including New Settlement (m^3/day)
Great Chesterford	1,284	1,098	0	1,637
Stansted Mountfitchet	2,650	2,135	336	3,010
Bishop's Stortford	17,349	14,238	97	14,874
Felsted	1,630	2,886	0	3,425

Following consultation with Anglian and Thames Water in light of the above results the following conclusions can be drawn for each of the New Settlement's potential locations:

- **Great Chesterford** – Existing flow consents are exceeded due to the new settlement but wastewater capacity could be provided subject to major upgrades to both the treatment processes at Great Chesterford WRC and associated sewerage networks. The extent of the required enhancement may justify other alternative strategies such as a new WRC or conveyance to Saffron Walden catchment if viable. Anglian Water have concerns regarding the level of growth and should be engaged by the site promoter as early as possible.
- **Elsenham** – Existing flow consents are exceeded due to the new settlement however wastewater capacity could be provided subject to significant upgrades to Stansted Mountfitchet WRC. Thames Water have concerns regarding the level of growth and should be engaged by the site promoter as early as possible.
- **Little Easton** – Existing flow consents are not exceeded due to the new settlement however there are process constraints at Bishop's Stortford WRC. Thames Water have confirmed that upgrades will be expected along with concerns regarding the level of growth and should be engaged by the site promoter as early as possible.
- **Stebbing** – Existing flow consents are significantly exceeded at Felsted WRC, is it not likely that upgrades can be undertaken to provide wastewater capacity. Following consultation with Anglian Water

they have confirmed that a new water recycling centre would likely be required and that they should be engaged by the site promoter as early as possible.

6.5 Water Quality

The major impact of the potential development sites on the water environment will be the variations in water quality and quantity discharged to receiving watercourses from the WRC that serve the sites. Where discharges from WRC will exceed the existing DWF consent, it is likely that the chemical constraints included within these consents will be tightened by the EA, to ensure that the water quality of the receiving watercourses does not deteriorate due to the increased discharges. When assessing possible consent changes the EA will take account of any sensitive sites and species downstream of the discharge, as well as the current dilution available from the river flow, and the possible benefits of increased flows.

The majority of receiving watercourses already exhibit high levels of phosphate, which cause them to be classed as not achieving good ecological status (or GES) under the WFD. This is a key concern throughout the majority of the East of England, and will require ongoing cooperation between water companies, the EA and other parties such as Defra to overcome this issue. It should be noted that development should not be permitted if it will lead to deterioration in water status or will prevent Good Status from being achieved.

WRCs treat the sewage by a variety of methods to a standard that allows the water to be discharged to a watercourse without harm to the environment. The EA provides the regulatory framework in terms of rate of discharge and acceptable water quality that AWS and TWU must achieve to allow the effluent to be discharged.

For WRCs which receive effluent from combined sewerage systems, the EA regulate flow volume discharged by limiting the DWF of the discharge to a maximum value. This is important, because the impact of a discharge on the receiving water is directly linked to the volume discharged. The effluent quality limits are determined on the basis of the consented DWF. In general, as the DWF increases, the quality limits become tighter.

Discharges from the WRC are calculated by the operator and a new consent issued by the EA which states a maximum DWF and corresponding limits for various parameters, principally BOD, phosphate and Ammonia. It should be noted that the consent limits set by the EA for the new discharge consent may not be within the limit of conventional technology and thus could constrain development within a WRC catchment.

Section 6.5.1 shows water quality summary and likely WRC discharges impact due to proposed development trajectory at Towns and Key Villages whereas Section 6.5.2 shows the cumulative impacts including potential New Settlements.

6.5.1 Towns and Key Villages Impacts

The results in Section 6.3 show that the calculated future DWF due to the development trajectory at Towns and Key Villages alone (i.e. excluding New Settlements) are lower than the existing consented DWF at all WRC apart from at Great Easton and Newport. Table 24 below further illustrates this scenario along with any water quality implications.

Table 24: Water Quality Summary – excluding New Settlement Impacts

WRC Catchment	River Discharge Point	Overall RMBP status	DWF Consent Exceeded	Discharge Permit Implications
Saffron Walden	Madgate Slade/ Kings Slade (Assume direct discharge to River Cam)	Poor	No	Indicates that the proposed development can be accommodated within the existing

WRC Catchment	River Discharge Point	Overall RMBP status	DWF Consent Exceeded	Discharge Permit Implications
Great Dunmow	Tributary of River Chelmer, Ash Grove	Moderate	No (not until 2029)	consent and that the existing permit will remain in place with DWF and limits intact.
Bishop's Stortford	River Stort (Great Hallingbury Brook)	Moderate	No	
Stansted Mountfitchet	Stansted Brook	Bad		
Great Easton	Tributary of River Chelmer	Moderate	Yes	In general, as the DWF increases, the quality limits become tighter. It is likely that the new consent will require tighter limits for all water quality determinants.
Newport	River Cam	Moderate	Yes	

It is recommended that development within the Great Easton and Newport catchments are phased, to allow improvements in the respective WRC to be made and new flow permits to be agreed before the majority of development is constructed. This would limit the impact on the receiving watercourses and make achieving the targets of the WFD more achievable.

6.5.2 New Settlements Impacts

Given the scale of the New Settlements, providing 1400 dwellings each within the plan period and the multiple options for their siting, for the purpose of the water quality assessment they have been assessed separately to the main trajectory above to determine the cumulative impacts for the impacted WRCs. In situations where a WRC is already impacted from the development trajectory for Towns and Key Villages (i.e. Stansted Mountfitchet and Bishop's Stortford) these have been considered together in order to assess the full impact by the New Settlements as shown in Table 25.

Table 25: Water Quality Summary – Including New Settlements Impacts

Wastewater Catchment	River Discharge Point	Overall RMBP status	DWF Consent Exceeded	Discharge Permit Implications
Great Chesterford	River Cam (Audley End to Stapleford)	Poor	Yes	In general, as the DWF increases, the quality limits become tighter. It is likely that the new consent will require tighter limits for all water quality determinants.
Stansted Mountfitchet	Stansted Brook	Bad	Yes	
Felsted	Stebbing Brook	Good	Yes	Existing consents are significantly exceeded. Following consultation with Anglian Water they have confirmed that a new water recycling centre would likely be required and this would have a new site specific discharge permit.

Wastewater Catchment	River Discharge Point	Overall RMBP status	DWF Consent Exceeded	Discharge Permit Implications
Bishop's Stortford	River Stort (Great Hallingbury Brook)	Moderate	No	Indicates that the proposed development can be accommodated within the existing consent and that the existing permit will remain in place with DWF and limits intact.

For the New Settlement sites it is recommended that consultation is undertaken early in the development process with the EA, Thames Water and Anglian Water to confirm if a new water recycling centre would likely be required. Engagement with the EA and Water Companies should occur as soon as possible, to discuss the water quality parameters required for increased growth in the catchment and upgrades to the existing WRCs. The permit limits might need to become tighter to ensure no deterioration in water body classification.

It is recommended that development at the New Settlement sites are phased, to allow improvements in the respective WRC to be made before the majority of development is constructed. This would limit the impact on the receiving watercourses and make achieving the targets of the WFD more achievable.

7 Flood Risk Management

7.1 Existing situation

There is the potential for new developments to impact downstream flood risk. The 2012 Detailed WCS captures the fluvial, surface water, groundwater and sewer flooding flood risk within the District. However, since writing the study new sources of data have become available, these have been identified as:

- Catchment Flood Management Plans (CFMPS)
- Strategic Flood Risk Assessment (SFRA)

7.2 Flood Risk Constraints

Following a review of the SFRA and the latest Environment Agency Flood Map, the following key constraints to the strategic development sites have been identified in Table 26.

Table 26: Flood Risk Constraints to the development sites

Settlement	Site Ref	Type	Flood Risk Constraint
Elsenham	07Els15	New Settlement	The northern portion of the site is bisected by existing watercourses (River Cam and associated tributaries). The Stansted Brook bisects the centre of the site, to the south of Henham Road. In the low lying areas corresponding to the watercourses there are associated areas of fluvial and surface water flooding.
	08Els15	Key Village	The site is not located in an area at risk of fluvial flooding. However, there are associated surface water flood risk areas at the southern boundary of the site. The site is upstream of Stansted which has recorded historical flooding.
Great Chesterford	10GtChe15	New Settlement	The site is not located in an area at extensive risk of surface or fluvial risk of flooding. There are limited areas of flooding along the corridors of existing watercourses (tributary of River Cam) along the southern edge of the site.
	05GtChe15	Key Village	The site is not located in an area of fluvial flooding, there is limited surface water flood risk identified along the south west border.
Great Dunmow	06GtDun15	Towns	The site is not located in an area of fluvial flooding, there is limited surface water identified on site.
	07GtDun15	Towns	The site is not located in an area of fluvial flooding, there is limited surface water identified on site. A band of surface water flood risk runs through the low lying central portion of the site.
	08GtDun15	Towns	The site is not located in an area of fluvial flooding, there is limited surface water identified on site. A low lying area adjacent to the northern boundary is at high risk of surface water flooding.
	12GtDun15	Towns	The site is not located in an area of fluvial flooding, there is limited surface water identified on site. A low lying area adjacent to the north eastern boundary is at high risk of surface water flooding.
Little Canfield	02LtCan15	Key Village	The site is not located in an area of fluvial or surface water flood risk.
	UTT/16/0270/FUL	Key Village	The site is not located in an area of fluvial or surface water flood risk.

Settlement	Site Ref	Type	Flood Risk Constraint
Little Easton	06LtEas15	New Settlement	The site is bordered along the western edge by the River Roding and its associated floodplain. Existing watercourses located in low lying areas of the site have surface water flood risk identified. Key area at risk is the central portion of the site.
Newport	03New15	Key Village	The site located adjacent to the River Cam but is not located in an area of fluvial or surface water flood risk.
	02New15	Key Village	The site located adjacent to the River Cam but is not located in an area of fluvial or surface water flood risk.
	06New15	Key Village	The site located adjacent to the River Cam but is not located in an area of fluvial or surface water flood risk.
Saffron Walden	04Saf15	Towns	The site is located adjacent to River Slade but not located in an area of fluvial or surface water flood risk.
	07Saf15	Towns	The site is located adjacent to River Slade but at low risk of fluvial flooding. Surface water flooding in location of ditch which runs through the centre of the site.
	11Saf15	Towns	The site is located adjacent to River Slade but at low risk of fluvial flooding. Surface water flooding in location of ditch which runs through the southern portion of the site.
	13Saf15	Towns	The site is located within Flood Zone 1 but adjacent to high risk Flood Zone 3.
	16Saf16	Towns	The site is not located in an area of fluvial or surface water flood risk.
	Land west of Lime Ave (UTT/15/3768/FUL)	Towns	The site is not located in an area of fluvial or flood risk. Northern portion of the site is at risk from surface water flooding.
Stansted	09Sta15	Key Village	The site is not located in an area of fluvial or surface water flood risk. The northern boundary of the site is in close proximity to Flood Zone 3.
	26Sta16	Key Village	The site is not located in an area of fluvial flood risk. A small low lying area of land is at risk of surface water flooding along the eastern boundary.
Stebbing	06Ste15	New Settlement	The Southern portion of site located in Flood Zone 3. Remainder of site in low risk fluvial zone. Surface water flood risk is present in ditches within site, mainly within the southern portion.
	05Ste15	New Settlement	The majority of the site is in low risk fluvial Flood Zone 1. The North eastern boundary of the site is located in Flood Zone 3. High surface water flood risk in low lying topography in the middle of the site.
Takeley	02HBO15	Key Village	The site is not located in an area of fluvial or surface water flood risk.
	03HBO15	Key Village	The site is not located in an area of fluvial or surface water flood risk.

Settlement	Site Ref	Type	Flood Risk Constraint
Thaxted	10Tha15	Key Village	The Northern portion of site (approximately 50% of the site area) is at high risk of surface water flooding. Site not at risk of fluvial flooding.
	14Tha15	Key Village	The site in fluvial flood zone 1. Minor area of surface water flooding on eastern portion of the site.

The SFRA (JBA, 2016) concluded that the extent of Flood Zone 3 is not likely to increase significantly with climate change due to the confined floodplain topography of existing watercourses in the District. However climate change is predicted to result in more frequent and extreme rainfall events, increasing the frequency and severity (depth/hazard) of flooding from fluvial and surface water sources.

In relation to groundwater, the effect of climate change is less certain. Milder wetter winters may increase the frequency of groundwater flooding incidents but warmer drier summers may counteract this effect.

7.2.1 Implications for development

Early consultation with the EA and LLFA is essential. Any development must pass the Sequential Test as per NPPF.

Sequential design of a new settlement at the master planning stage should ensure that built development and access routes are entirely within Flood Zone 1 and should avoid impacting on surface water flow routes or ordinary watercourses.

Opportunities should be exploited at the master planning stage for multiple benefits in terms of integrated sustainable drainage, green infrastructure, amenity, biodiversity and WFD status.

A drainage strategy must be submitted at an early stage to show how the impact of the development will be reduced through the use of SuDS. All major developments must carry out an FRA including and assessment of flood risk from all sources, and hydraulic modelling of the watercourses to better define the Flood Zones, water levels and the impact of climate change.

Anglian Water and Thames Water should be consulted at an early stage for major developments to ensure that there will be sufficient capacity in the wastewater system and any upgrades are carried out where necessary.

7.3 Flood Risk from WRC Discharges

Increased discharge volumes from WRCs to watercourses have the potential to increase fluvial flood risk and a multi-criteria scoring system has been applied to assess the risk. The assessment uses a multi-criteria approach to assess the increase in peak flow, the sensitivity of the watercourse to changes in flood levels, and the potential impact of flooding in order to determine a combined flood risk index. The following three elements of the system are principal:

- Quantification of the increase in peak river flows, resulting from the predicted increase in treated effluent discharges;
- Evaluation of the likely sensitivity of flood levels to increases in flood flows; and
- Evaluation of the impact of increases in flood levels.

For each principal element listed above, the impact at each discharge site has been classified as high, medium or low; and the multi-criteria analysis applied to combine these elements.

7.3.1 Methodology

The analysis has been conducted using the 1 in 2 year flood, also known as the 50% AEP (Annual Exceedance Probability) event. This has a probability of occurrence in any one year of 50%. It is also referred to as QMED. According to the AWS methodology, this flood severity was selected because:

- Increases in WRC discharge would contribute a relatively greater proportion of flood flows than if a more extreme flood event had been used, and hence results are likely to be conservative;
- The 1 in 2 year event is, very crudely, considered to approximate bankfull conditions. Any increase in the 1 in 2 year event would therefore be expected to result in out of bank flooding;
- The 1 in 2 year event is the smallest event which can practically be estimated using standard techniques; and
- It aligns with the 2012 Detailed WCS enabling direct comparison.

The increase in the 1 in 2 year peak flow in the receiving watercourse has been calculated using the same methodology descried in the 2011 Detailed WCS and is in line with best practise techniques as stated in the Flood Estimation Handbook (FEH). The increase in discharge from the WRC used in these calculations are to be found in Section 6.

DWF received at the WRCs will increase following the connection of new dwellings to the sewerage network. Whilst some of this increase may be stored on the WRC sites during peak flows, an increase to the volumetric flow rate of the discharge is likely. However, WRCs s typically discharge up to three times their DWF (referred to as flow to full treatment – FTFT) at peak. An increase in FTFT, due to growth in the catchment, may increase the flood risk to properties and environmental sites on the watercourse downstream of the discharge point.

Multi-criteria analysis (as described above) has been utilised to provide a risk score for each of the six impacted discharge points. Flood Risk scores were assigned to each discharge by determining the contribution that the increased FTFT (due to the proposed growth to 2032) makes to the flow levels in the watercourse during a 1 in 2 year flood. This was then weighted to account for the sensitivity of the watercourse to flow increases, and the potential local impacts of any flooding (this aligns directly with the 2012 Detailed WCS methodology).

7.3.2 Results

It must be highlighted that the above methodology compares the total 2032 FTFT from the WRCs (flows from both existing and proposed dwellings) against the 1 in 2 year flood events for the watercourses, hence providing a risk score for the total predicted flows by 2032.

As acknowledged in the 2012 Detailed WCS, if FTFT from the existing properties is considered to be an integral part of the current river flows, it can be shown that the actual increase in peak flows by rivers by 2032, which is solely attributable to proposed growth, makes up a considerably smaller proportion.

In accordance with NPPF Technical Guidance, an additional 20% was added to the 1 in 2 year flood flows. The new FTFT values have been projected to 2032 at each site; therefore considering river flow values, including an +25% allowance for climate change, would make the impact of the future FTFT flows seem more significant than they could possibly be by 2032.

As identified in the below results table, none of the proposed increases in WRC discharges appreciably change the flow risk score when compared against the current baseline situation. The risk value for all eight WRC sites has been assessed as low or medium, therefore **the increased flow from each WRC site is classified overall as having a low flood risk.**

It has for some time been acknowledged that climate change will impact flood risk in the future. This is a risk defined in the 2012 Detailed WSC as “the frequency and intensity of future rainfall events may increase due to climate change, leading to higher run-off rates into surrounding rivers, altering the hydraulic response of the river to the rainfall event”. It is now academically accepted that climate change has had such an effect on UK flooding.

It follows therefore that the flow rates associated with 1 in 2 year events (as described in the analysis above) have been predicted to occur more frequently in the future. Whilst the significance of the WRC discharges, and downstream impacts and sensitivity are likely to remain the same for any given river flow; the frequency of flooding is likely therefore to increase. UDC should therefore continue to ensure that flood resilience and mitigation remain key in the decision-making process of their Planning and Development Control Functions.

Table 27: Summary of flood risk multi-criteria analysis results.

	Impact of existing WRC FTFT on baseline river flows (i.e. without extra flows from new development)			Increase in river flows by 2032 based on entire WRC FTFT (including existing WRC DWF)		
WRC Discharge	**Increase in 1 in 2 year river flow**	**Flood Flow Risk Value**	**Risk Assessment**	**Increase in 1 in 2 year river flow**	**Flood Flow Risk Value**	**Risk Assessment**
Saffron Waldon	3.95%	3	Medium	3.85%	3	Medium
Great Dunmow	0.55%	1	Low	0.82%	1	Low
Bishop's Stortford	0.92%	1	Low	0.84%	1	Low
Great Easton	3.65%	3	Medium	3.35%	3	Medium
Newport	0.25%	1	Low	0.27%	1	Low
Stansted Mountfitchet	0.83%	1	Low	0.81%	1	Low
Great Chesterford	0.18%	1	Low	0.15%	1	Low
Felsted	0.91%	1	Low	0.83%	1	Low

Flood Flow Risk Value:

- Flow increase between 0 and 1%: 1 (Low)
- Flow increase between 1 and 3%: 2 (Low)
- Flow increase between 3 and 10%: 3 (Medium)
- Flow increase between 10 and 20%: 4 (Medium
- Flow increase greater than 20%: 5 (High)

7.4 Suitability of Sustainable Drainage Systems

Sustainable Drainage Systems (SuDs) are methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques.

Development could have a significant impact on flood risk downstream if SuDS principles and strict controls on runoff are not enforced. Opportunity should be taken by UDC and developers to incorporate techniques such as these at the potential development sites, in order to comply with the Building Regulations, NPPF and local policies implemented by both UDC and Essex County Council.

The Outline WCS (2009) provides high level guidance on the implementation of SuDS according to the SuDS hierarchy and the SuDS management train. A drainage strategy must be submitted for all sites at an early stage to show how the impact of the development will be reduced through SuDS techniques, with surface water run-off rates attenuated according to Essex County Council's SuDS Guidance local design standards. The drainage strategy should demonstrate that existing surface water flow paths will be preserved.

The low permeability of the Boulder Clay, which overlies the majority of the District, may preclude the use of shallow infiltration SuDS techniques. However, if localised tests suggest that there is suitable permeability for a given technique, developers and UDC should consult the EA to ensure that any SuDS design takes account of any SPZ and other areas where the aquifers may be vulnerable, and ensure that the risk of pollution is adequately controlled.

A high-level strategic overview of the suitability, or not, of the development locations to utilise certain infiltration based SUDS techniques can be formed (Table 28). However, this will still be subject to the depth of infiltration SuDS techniques and soil permeability tests.

Table 28: High level SuDS Appraisal

Settlement	Site Ref	Type	SuDS Appraisal
Elsenham	07Els15	New Settlement	**Geology/superficial deposits-** London Clay Formation and Thanet Sands overlain by Diamicton and sands and gravels **Soils**- Slightly acidic but rich soils **SPZ**- Northern half of 07Els15 is located within SPZ 2 Most SuDS techniques should be suitable here as an integrated part of a new settlement. Slope and soil permeability will vary locally across the area, although the soil generally has slightly impeded drainage
	08Els15	Key Village	
Great Chesterford	10GtChe15	New Settlement	**Geology/superficial deposits-** Chalk Formation overlain by river terrace deposits **Soils**- Slightly acidic but rich soils **SPZ**- located within SPZ 3 Most SuDS techniques should be suitable here as an integrated part of a large new development. Slope and soil permeability will vary locally across the area but is generally freely draining. Infiltration, filtration and detention SuDS will be limited close to River Cam where the groundwater is higher.
	05GtChe15	Key Village	
Great Dunmow	06GtDun15	Towns	**Geology/superficial deposits-** London Clay Formation overlain with diamicton and alluvium **Soils**- Lime rich Loamy soils with some areas of rich-acidic loamy soil **SPZ**- Site is not located within a SPZ
	07GtDun15		
	08GtDun15		
	12GtDun15		

Settlement	Site Ref	Type	SuDS Appraisal
	UTT/16/0270/FUL		Most SuDS techniques should be suitable here as an integrated part of new development. Slope and soil permeability will vary locally across the areas, from freely draining to slightly impeded drainage.
Little Easton	06LtEas15	New Settlement	**Geology/superficial deposits-** London Clay Formation overlain by diamicton and sands and gravels **Soils**- Lime-rich loamy and clayey soils **SPZ**- Site is not located within a SPZ Most SuDS techniques should be suitable here as an integrated part of a large new settlement. Slope and soil permeability will vary locally across the area. The soil within the area generally has slightly impeded drainage, with freely draining soils in the far east.
Newport	03New15	Key Village	**Geology/superficial deposits-** London Clay Formation overlain by allivuim and diamicton **Soils**- Lime rich Loamy soils with some areas of rich-acidic loamy soil **SPZ**- located within SPZ 2 and 3 Most SuDS techniques should be suitable here as an integrated part of a large new development. Slope and soil permeability will vary locally across the area but is generally freely draining
	02New15		
	06New15		
Saffron Walden	04Saf15	Towns	**Geology/superficial deposits-** Chalk overlain by diamicton and alluvium **Soils**- Lime-rich loamy and clayey soils **SPZ**- Site is located within SPZ 3 Most SuDS techniques should be suitable here as an integrated part of a large new development. Slope and soil permeability will vary locally across the area. The areas generally have freely draining soils, with some areas of soils with slightly impeded drainage.
	07Saf15		
	11Saf15		
	13Saf15		
	16Saf16		
	Land west of Lime Ave (UTT/15/3768/FUL)		
Stansted	09Sta15	Key Village	**Geology/superficial deposits-** Chalk and Thanet Sands overlain by diamicton and glacio-fluvial deposits **Soils**- Acidic but rich soils and lime rich loamy and clayey soils **SPZ**- Site is not located within a SPZ Most SuDS techniques should be suitable here as an integrated part of a large new development. Slope and soil permeability will vary locally across the area but is generally freely draining. Infiltration, filtration and detention. SuDS will be limited close to the Stansted Brook where the groundwater is higher.
	26Sta16		
Stebbing	06Ste15	New Settlement	**Geology/superficial deposits-** London Clay Formation overlain by diamicton and sands and gravels **Soils**- Lime-rich loamy and clayey soils with some areas of rich-acidic loamy soil **SPZ**- Site is not located within a SPZ Most SuDS techniques should be suitable here as an integrated part of a large new settlement. Slope and soil permeability will vary locally
	05Ste15		

Settlement	Site Ref	Type	SuDS Appraisal
			across the area. The soil within the area generally has slightly impeded drainage, with freely draining soils located in the Stebbing Brook valley through the centre of the area.
Takeley	02HBO15	Key Village	**Geology/superficial deposits-** London Clay Formation overlain by diamicton **Soils**- Lime rich Loamy and clayey soils **SPZ**- Site is not located within a SPZ Most SuDS techniques should be suitable here as an integrated part of a large new development. Slope and soil permeability will vary locally across the area but generally the soil has slightly impeded drainage.
	03HBO15		
Thaxted	10Tha15	Key Village	**Geology/superficial deposits-** London Clay Formation and Thanet Sands overlain by diamicton and glaciofluvial deposits **Soils**- Lime rich Loamy soils with some areas of rich-acidic loamy soil **SPZ**- Site is not located within a SPZ Most SuDS techniques should be suitable here as an integrated part of a large new development. Slope and soil permeability will vary locally across the area, from freely draining to slightly impeded drainage.
	14Tha15		

The above assessment is based on an assessment of mapping from the SFRA (JBA, 2016) which is at a District wide scale. As such, localised testing, and discussions with the EA regarding the suitability of SuDS techniques is recommended for every site, in conjunction with a Flood Risk Assessment where required by NPPF.

8 Constraints and Opportunities

The table below contains a summary of the constraints and opportunities relating to each development site. Constraints mapping for each site is contained in Appendix D.

Table 29: Constraints and Opportunities Summary

Settlement	Site Ref	Type	Existing WRC	Flooding	Environmental Designation	Water Quality		Wastewater Treatment	Sewerage
Elsenham	07Els15	New Settlement	Stansted Mountfitchet	Site is bisected by existing watercourses and there are associated area of fluvial and surface water flooding. Site is located upstream of Stansted Mountfitchet and Elsenham, parts of which are culverted.	No designated sites within 10km.	Northern half of the site is located within SPZ 2. It is likely that a new consent will require tighter limits for all water quality, to ensure there is no deterioration to the water environment.			
	08Els15	Key Village	Stansted Mountfitchet	Site is not located in an area at risk of fluvial flooding however is there are associated surface water flood risk areas in the south of the site. The site is upstream of Stansted Mountfitchet which has recorded historic flooding.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.		
Great Chesterford	10GtChe15	New Settlement	Great Chesterford	Site is not located in an area at extensive risk of surface or fluvial risk of flooding. There are limited areas of flooding along existing watercourses along the southern edge of the site.	No designated sites within 10km.	Site is located across both SPZ 2 and 3. It is likely that a new consent will require tighter limits for all water quality, to ensure there is no deterioration to the water environment.			
Gt Dunmow	06GtDun15	Towns	Great Dunmow	Site is not located in an area of fluvial flooding, there is limited surface water identified on site.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory following upgrades. Site promoters are recommended to	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be required
	07GtDun15	Towns		Site is not located in an area of fluvial flooding, there is limited surface water identified on site.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the	No water supply constraints identified. Demand to be met through efficiency measures.		

Settlement	Site Ref	Type	Existing WRC	Flooding	Environmental Designation	Water Quality	Water Supply	Wastewater Treatment	Sewerage
						existing consent and the existing permit can remain in place with DWF and limits intact.		engage Anglian Water as early as possible in the planning process.	to liaise with Anglian Water on a site-specific basis.
	08GtDun15	Towns		Site is not located in an area of fluvial flooding, there is limited surface water identified on site.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory, following the ongoing upgrades and the flow transfer to Felsted. Site promoters are recommended to engage Anglian Water as early as possible in the planning process.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be required to liaise with Anglian Water on a site-specific basis.
	12GtDun15	Towns		Site is not located in an area of fluvial flooding, there is limited surface water identified on site.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory, following the ongoing upgrades and the flow transfer to Felsted. Site promoters are recommended to engage Anglian Water as early as possible in the planning process.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be required to liaise with Anglian Water on a site-specific basis.
Little Canfield	02LtCan15	Key Village	Bishop's Stortford	Site is not located in an area of fluvial or surface water flood risk.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.		Thames Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Thames on a site-specific basis.
Little Easton	06LtEas15	New Settlement		Site is bordered along the western edge by the River Roding and its associated floodplain. Existing watercourses on site have surface water flood risk identified.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	Substantial new water supply infrastructure will be required (i.e. in addition to water efficiency). It is recommended that site specific assessments are undertaken as part of the development planning process to cover the detailed requirements of these sites.	Existing consents are not exceeded due to the new settlement however there are process constraints. Thames Water have confirmed that upgrades will be expected along with concerns regarding the level of growth and should be engaged by the site promoter as early as possible.	Thames Water have not highlighted any 'showstoppers' at this stage of the WCS. Given the scale of the development site significant upgrades will be required. Site promoters will still be required to liaise with Thames Water on a site-specific basis.
Newport	03New15	Key Village	Newport	Site located adjacent to the River Cam but is not located in an area of fluvial or surface water flood risk.	No designated sites within 10km.	Site is located within SPZ 3. It is likely that a new consent will require tighter limits for all water quality determinants.	No water supply constraints identified. Demand to be met through efficiency measures.	Major upgrades are required to serve the development trajectory. The wastewater capacity of Newport WRC should be considered a constraint to development. Site promoters should engage early with Anglian Water.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Anglian on a site-specific basis.
	02New15	Key Village		Site located adjacent to the River Cam but is not located in an area of	No designated sites within 10km.	Site is located within SPZ 3.	No water supply constraints identified. Demand to be met through efficiency measures.	Major upgrades are required to serve the development trajectory. The wastewater capacity of	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site

Settlement	Site Ref	Type	Existing WRC	Flooding	Environmental Designation	Water Quality	Water Supply	Wastewater Treatment	Sewerage
				fluvial or surface water flood risk.		It is likely that a new consent will require tighter limits for all water quality determinants.		Newport WRC should be considered a constraint to development. Site promoters should engage early with Anglian Water.	promoters will still be regard to liaise with Anglian on a site-specific basis.
	06New15	Key Village		Site located adjacent to the River Cam but is not located in an area of fluvial or surface water flood risk.	No designated sites within 10km.	Site is located within SPZ 2 and 3. It is likely that a new consent will require tighter limits for all water quality determinants.	No water supply constraints identified. Demand to be met through efficiency measures.	Major upgrades are required to serve the development trajectory. The wastewater capacity of Newport WRC should be considered a constraint to development. Site promoters should engage early with Anglian Water.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Anglian on a site-specific basis.
	07Saf15	Towns		Adjacent to River Slade but at low risk of fluvial flooding. Surface water flooding in location of ditch which runs through the centre of the site.	No designated sites within 10km.	Site is located within SPZ 3. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory. Site promoters are recommended to engage Anglian Water as early as possible in the planning process.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Anglian on a site-specific basis.
Saffron Walden	11Saf15	Towns	Saffron Walden	Adjacent to River Slade but at low risk of fluvial flooding. Surface water flooding in location of ditch which runs through the southern portion of the site.	No designated sites within 10km.	Site is located within SPZ 3. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory. Site promoters are recommended to engage Anglian Water as early as possible in the planning process.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Anglian on a site-specific basis.
	13Saf15	Towns		Located within Flood Zone 1 but adjacent to high risk Flood Zone 3.	No designated sites within 10km.	Site is located within SPZ 3. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory. Site promoters are recommended to engage Anglian Water as early as possible in the planning process.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Anglian on a site-specific basis.
	16Saf16	Towns		Site is not located in an area of fluvial or surface water flood risk.	No designated sites within 10km.	Site is located within SPZ 3. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory. Site promoters are recommended to engage Anglian Water as early as possible in the planning process.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Anglian on a site-specific basis.

Settlement	Site Ref	Type	Existing WRC	Flooding	Environmental Designation	Water Quality	Water Supply	Wastewater Treatment	Sewerage
	Land west of Lime Ave. (UTT/15/3768/FUL)	Towns		Site is not located in an area of fluvial or flood risk. Northern portion of the site is at risk from surface water flooding.	No designated sites within 10km.	Site is located within SPZ 3. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory. Site promoters are recommended to engage Anglian Water as early as possible in the planning process.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Anglian on a site-specific basis.
Stansted Mountfitchet	09Sta15	Key Village	Stansted Mountfitchet	Site is not located in an area of fluvial or surface water flood risk.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory. Site promoters are recommended to engage Thames Water as early as possible in the planning process.	Thames Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Thames on a site-specific basis.
	26Sta16	Key Village		Site is not located in an area of fluvial or surface water flood risk.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory. Site promoters are recommended to engage Thames Water as early as possible in the planning process.	Thames Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Thames on a site-specific basis.
Stebbing	06Ste15/05Ste15	New Settlement	Felsted	Southern portion of site located in Flood Zone 3. Remainder of site in low risk fluvial zone. Surface water flood risk is present in ditches within site, mainly within the southern portion.	Ancient Woodland located within the site.	Site is not located within a SPZ. It is likely that a new consent will require tighter limits for all water quality, to ensure there is no deterioration to the water environment.	Substantial new water supply infrastructure will be required (i.e. in addition to water efficiency). It is recommended that site specific assessments are undertaken as part of the development planning process to cover the detailed requirements of these sites.	Existing consents are significantly exceeded at Felsted WRC, is it not likely that upgrades can be undertaken to provide wastewater capacity. Following consultation with Anglian they have confirmed that a new water recycling centre would likely be required and that they should be engaged by the site promoter as early as possible.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Anglian on a site-specific basis.
Takeley	02HBO15/03HBO15	Key Village	Bishop's Stortford	Site is not located in an area of fluvial or surface water flood risk.	No designated sites within 10km.	Site is not located within a SPZ. The proposed development can be accommodated within the existing consent and the existing permit can remain in place with DWF and limits intact.	No water supply constraints identified. Demand to be met through efficiency measures.	There is capacity available to serve the development trajectory. Site promoters are recommended to engage Thames Water as early as possible in the planning process.	Thames Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to liaise with Thames on a site-specific basis.
Thaxted	14Tha15	Key Village	Great Easton	Site in fluvial flood zone 1. Minor area of surface water flooding on eastern portion of the site.	No designated sites within 10km.	Site is not located within a SPZ. It is likely that a new consent will require tighter	No water supply constraints identified. Demand to be met through efficiency measures.	Significant upgrades are required to the treatment process to be able to serve the development trajectory. Site promoters should engage early with Anglian Water.	Anglian Water have not highlighted any 'showstoppers' at this stage of the WCS. Site promoters will still be regard to

Settlement	Site Ref	Type	Existing WRC	Flooding	Environmental Designation	Water Quality	Water Supply	Wastewater Treatment	Sewerage
						limits for all water quality determinants.			liaise with Anglian on a site-specific basis.

9 Conclusions

Uttlesford District Council has updated its previous preferred development options in line with the SHMA published in 2015 which identified the housing requirements for the district for the period 2011-2032. The new emerging development options are higher than the totals analysed in the 2012 Detailed WCS, however, the emerging Local Plan increases the number of allocations. The draft development trajectory has been analysed as part of the WCS update along with four New Settlement location options. This Study forms part of the evidence base to assist the Council in deciding the number and location of allocations including any new settlements in the Local Plan.

The conclusions of the initial assessment are presented in the section below. It is considered that the capacity of the water recycling centres and the associated impact on water quality are the greatest potential issues in relation to the development aspirations within Uttlesford.

As this is an update to the WCS it should be treated as a 'living document' with the conclusions and analysis being subject to change following further investigation and consultation.

9.1 Water Resources and Supply

The initial demand calculations show an overall increase in demand of some 3,500m^3/day between 2016 and 2032. Affinity Water have concluded there is not enough water to meet the increasing demand in all of the operating areas, and therefore Affinity Water have undertaken an options appraisal to consider ways to resolve the deficits. With the appropriate mitigation measures the WRMP concluded demand can be met, however developers should liaise with Affinity Water early in the development process. It is recommended that the larger new settlement sites undertake site specific assessments.

Substantial new water supply infrastructure will be required for the New Settlement sites (i.e. in addition to water efficiency). It is recommended that site specific assessments are undertaken as part of the development planning process to cover the detailed requirements of these sites.

9.2 Wastewater and Sewerage

The initial assessment results provide a general indication of the impacts of the proposed trajectory on existing wastewater assets. The treatment capacity of each water recycling centre and discharge consent constraints are summarised below along with sewer network capacity issues.

Table 30: Summary of Wastewater Treatment Process, Sewerage Infrastructure (excluding the impact of New Settlements)

WRC Catchment	Community Served	Wastewater Treatment	Foul Sewerage Network
Saffron Walden	Saffron Walden	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Great Dunmow	Great Dunmow	There is capacity available to serve the development trajectory, following the ongoing upgrades and the flow transfer to Felsted.	Minimum upgrades required to accommodate development trajectory.
Bishop's Stortford	Takeley Little Canfield	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.

WRC Catchment	Community Served	Wastewater Treatment	Foul Sewerage Network
Great Easton	Thaxted	Upgrades are required to the treatment process to be able to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Newport	Newport	Major upgrades are required to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.
Stansted Mountfitchet	Elsenham Stansted Mountfitchet	There is capacity available to serve the development trajectory.	Minimum upgrades required to accommodate development trajectory.

A high-level exercise has been undertaken to assess the impact of the new settlements. Where the WRC is already impacted from the development above these have been considered together in order to assess the full impact:

- **Great Chesterford** – the cumulative flow including the New Settlement is estimated to exceed the existing consent, assuming that the WRC serves the New Settlement site at Great Chesterford.
- **Stansted Mountfitchet** - the cumulative flow including the New Settlement is estimated to exceed the existing consent, assuming that the WRC serves the New Settlement site at Elsenham.
- **Bishop's Stortford –** the cumulative flow including the New Settlement is estimated not to exceed the existing consent, assuming that the WRC serves the New Settlement site at Little Easton.
- **Felsted** - the cumulative flow including the New Settlement is estimated to exceed the existing consent, assuming that the WRC serves the New Settlement site at Stebbing.

As the Local Plan progresses, and if new settlement(s) are allocated they may require a further site specific assessment, developed in co-operation with Anglian Water and Thames Water, based on the conclusions of the current WCS Update.

Overall following consultation with Anglian and Thames Water no significant sewerage capacity issues with any of the sites to warrant as potential "show stoppers", however many of the sites would likely require some upgrades where necessary in order to accommodate the increased flow. Developers should contact Anglian and Thames Water in order to assess what upgrades are required following the Site Allocation process as part of pre-development enquiries as the individual sites enter the normal planning application process.

9.3 Water Quality

The key development sites located within each catchment are detailed below:

- **Cam and Ely Ouse**- Saffron Walden, Newport and Great Chesterford
- **Thames**- Elsenham, Takeley, Stansted andLittle Easton
- **Combined Essex**- Thaxted, Great Dunmow and Great Easton, Felsted, Stebbing

The major impact of the potential development sites on the water environment will be the variations in water quality and quantity discharged to receiving watercourses from the site itself (surface water runoff) and the WRC that serve the sites. Water discharged from the sites will require careful management to ensure the development does not have a detrimental impact on the water environment.

The results of the qualitative water quality analysis indicate that the proposed development will not lead to a Deterioration of WFD status or will compromise the achievement of WFD Good status in the receiving watercourses although tightened water quality parameters will be required where WRC flow consents have

been exceeded. It is likely that tightening of water quality standards set by discharge permits. Developers should engage with the EA and Water Companies as soon as possible in the planning process to facilitate timely site specific assessments are negotiations are undertaken to address the identified constraints.

9.4 Flood Risk Management

Following a review of the Uttlesford Strategic Flood Risk Assessment and the latest Environment Agency Flood Map, small areas of the following sites are at high risk of flooding:

- Elsenham (07Els15)
- Great Chesterford (10GtChe15)
- Little Easton (06LtEas15)
- Stebbing (06Ste15 and 05Ste15)

Early consultation with the EA and LLFA is essential. Any development must pass the Sequential Test as per NPPF. Opportunities should be exploited at the master planning stage for multiple benefits in terms of integrated sustainable drainage, green infrastructure, amenity, biodiversity and WFD status.

A high level assessment indicates that none of the proposed increases in WRC discharges appreciably increase flow risk when compared against the current baseline situation and the increased flow from each WRC site is classified overall as having a low flood risk.

9.5 Conclusions For New Settlements

The Water Cycle Study Update conclusions in relation to the potential New Settlement locations are described below. All four sites have a similar level of general constraints and opportunities in relation to water management although the main differentiating constraint to development is considered to be the capacity of the receiving water recycling centre.

Existing flow consents are not exceeded at Bishop's Stortford, however there are process constraints at Bishop's Stortford water recycling centre. Thames Water has confirmed that upgrades will be expected along with concerns regarding the level of growth at Little Easton and should be engaged by the site promoter as early as possible.

Existing flow consents are exceeded due to the new settlements but wastewater capacity could be provided subject to major upgrades to both the treatment processes and associated sewerage networks at the following water recycling centres:

- Great Chesterford (serves Great Chesterford New Settlement)
- Stansted Mountfitchet (serves Elsenham New Settlement)

The extent of the required enhancement at Great Chesterford WRC may justify other strategies such as a new WRC or conveyance to Saffron Walden WRC catchment if viable. Consultation indicates that both Thames Water and Anglian Water have concerns regarding the level of growth and it is recommended they are engaged by the site promoters as early as possible.

If the New Settlement site is located at Stebbing initial calculations show that the existing flow consent will be significantly exceeded at Felsted water recycling centre. It is not likely that upgrades can be undertaken to provide wastewater capacity and a new water recycling centre would likely be required. It is recommended that Anglian Water is engaged by the site promoters as early as possible.

APPENDIX A

Data Register

ARCADIS Design & Consultancy for natural and built assets

Project Code: UA009072

Project Title: Uttlesford WCS Update. Stakeholder Consultation Responses

Reference	Key Stakeholder Consultation	Body	Date / Response
1	Water Quality Data. Flow and permitted discharge data at all WwTW discharge points.	EA	- Flow data and confirmation of the existing discharge permit standards for each WwTW dischage point -14/11/2016 (email and phone correspondance).
2	Details of correspondance below. Consultation was the same for both Anglian and Thames Water- 1. Confirmation of existing consents and population data for each WwTW. 2. Comments on the four new settlement locations and wastewater treatment / capacity impacts.	Thames Water	- GIS layers provided- 01/11/2016. - Confirmation of WwTW catchments (phone and email records)- 08/11/2016. - RAG comments on all development sites and development trajectory (phone and email records)- 08/11/2016.
3	3. Comments on initial calculations and trajectories for each WwTW.	Anglian Water	- GIS layers- 3/10/2016. - RAG comments on all development sites- 1/11/2016.
4	1. Uttlesford District Existing Dwellings – In order to generate our baseline assessment we require the number of dwellings that currently exist (have been built) within the district. Using our data from the 2012 study we have estimated this figure as 34,216. Can you please confirm whether this is accurate, if not please provide an updated figure. 2. Uttlesford Occupancy Rates – We have proposed applying the same occupancy rate as the 2012 study, 2.43. Can you please comment on the suitability of this for the assessment period (2016-3032). 3. Proposed WCS Household Demand Scenarios – We have drafted three scenarios for potable water demand assessment within the district, can you please provide comment on them. 4. Comment on the population trajectory used in the demand calculations. 5. Confirmation of the preferred scheme for WRZ5.	Affinity Water	- No response received. - Date from the WRMP used to inform the WCS update.

ARCADIS Design & Consultancy for natural and built assets

Project Code: UA009072 **Project Title:** Uttlesford WCS Update. Data Register.

Reference	Information Received	Issuing Body
1	Relevant Planning Policy Documents: -Economic Viability Study on Local Plan New Settlement and Neighbourhood Proposals (infrastructure requirements) -Emerging Local Plan -Relevant supplementary documents - Strategic Flood Risk Assessment - Consultation Comments (Dec 2015) -Sustainability Appraisal	UDC
2	Preferred site allocations mapping	UDC
3	Housing Trajectory updated with allocations	UDC
4	2012 Stage 2 Detailed WCS	UDC/Arcadis
5	Anglian Water Asset Datasets: Sewers / Outfalls / WwTW and consent data	Anglian Water
6	Thames Water Asset Datasets: Sewers / Outfalls / WwTW and consent data	Thames Water
7	Water Quality Data	Thames / Anglian Water, EA
8	Existing licenced abstractions	EA
9	Flow and permitted discharge data at all WwTW discharge points	EA
10	EA/NE OpenData: -CAMS Boundaries -WFD Management areas -SAC/SPA/Ramsar sites	Natural England / Environment Agency
11	Affinity 2015 Water Resource Management Plan	Affinity Water
12	Cams and Ely Ouse / Combined Essex / Roding / Beam and Ingrebourne / Upper Lee Catchment Abstraction Licencing Strategies	EA
13	Anglian / Thames 2015 River Basin Management Plan	EA
14	Comments on development trajectories and implications for WwTW and network capacity	Thames / Anglian Water
15	Red Amber Green constraints assessment of WwTWs	Thames / Anglian Water

APPENDIX B

Demand Projection Scenarios

Best Case

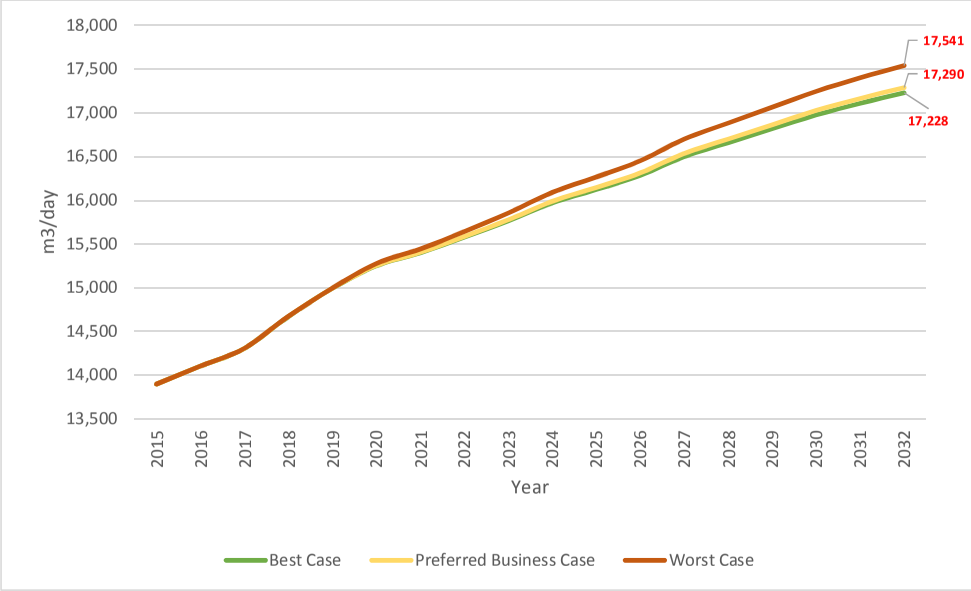
2015	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*	*2026*	*2027*	*2028*	*2029*	*2030*	*2031*	*2032*
13898	14105	14307	14672	14993	15252	15400	15577	15764	15969	16123	16284	16499	16659	16818	16976	17109	17228

Preferred Business Case

2015	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*	*2026*	*2027*	*2028*	*2029*	*2030*	*2031*	*2032*
13898	14105	14307	14673	14994	15254	15405	15586	15778	15989	16147	16314	16536	16701	16864	17027	17165	17290

Worst Case

2015	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*	*2025*	*2026*	*2027*	*2028*	*2029*	*2030*	*2031*	*2032*
13898	14105	14308	14674	14996	15278	15444	15644	15856	16091	16266	16452	16700	16883	17065	17246	17401	17541



Scenario	Change in I	Change in Demand (%)
Best Case	3,330	23.96%
Preferred Business Case	3,391	24.40%
Worst Case	3,643	26.21%

APPENDIX C

Development Trajectory

UTTLESFORD DISTRICT COUNCIL

HOUSING TRAJECTORY AND 5-YEAR LAND SUPPLY

Housing Trajectory

Planning Policy Guidance requires Local Authorities to undertake housing and economic land available assessment. Paragraph ID3-006-20140306 sets out the overall methodology. This paper considers the deliverability (5 year supply) and developability of housing ie Stage 5.

The council's adopted Local Plan 2005 pre-dates the National Planning Policy Framework (NPPF) and a new Local Plan reflecting the the NPPF is being prepared and is programeed to be submitted in August 2016 and adopted in 2017. The Council is currently undertaking a call for sites and an assessment of its objectively assessed need. As the adopted Local Plan does not provide an adequate basis for the identification of the objectivley assessed need the Council need to refer to the advice of the PPG and its own demographic work and reference can be made to the conclusions of the Inspector who considered the Local Plan submitted in 2014 and [illegible] by withdrew.

Paragraph ID 2a-015-20140306 recommends that household projections published by the Department for Communities and Local Government should provide the starting point estimate of overall housing need.

The Council has made an initial consideration of DCLG's recently published 2012-based household projections. Between 2012 and 2037 the projections estimate a total increase of 12,054 households which equates to an average annual increase of 482 households[1] which equates to 506 dwellings per year[2]. An uplift to take into account market signals would need to be applied to this figure. If the same approach taken by the Local Plan inspector is applied this would increase to 557 dwellings per annum.

[1] DCLG live tables on houseold projections: Table 425 Total change, average change and percentage change in household projections for local authority districts, England 2012-2037

[2] To convert number of households to the number of dwellings one applies the conversion factor of 0.953 (based on figures from the 2011 census of households divided by dwellings).

In his conclusions, dated 19 December 2014, the Local Plan Inspector considered that the demographically modelled household projections required some upward adjustment to take into account market signals such as affordability. In his view it would be appropriate to examine an overall increase of around 10% to about 580 dwelling per annum. In a recent appeal decision (APP/C1570/A/14/2223280) the inspector considered that the figure of 580 is representative of the objectivley assessed housing needs in the District at the present time and In relation to other aspects of requirement the Local Plan Inspector made the following comments

That housing delivery performance over the last 13 years has not fallen significantly below appropriate targets for the years in question and therefore the buffer does not need to be increased beyond the standard 5%. However, in the recent appeal decision (APP/C1570/A/14/2223280) the Inspector found the requirement for a 20% buffer. The Council is awaiting decisions on a number of other appeals which will hopefully clarify the position.

There is no local or contemporary evidence which would justify the application of a standard 'lapse rate; for outstanding residential planning permissions.

There is no requirement to add to the Objectively Assessed Need to cater for any 'backlog' calculated against years preceeding the 2011 base- year.

In relation to supply, the Local Plan Inspector concluded that the windfall allowance of 50dpa is reliably based upon well-evidenced research and consistent with the NPPF.

He considered that the housing trajectory then (which has now been rolled forward a year and updated with completions) reflects a generally healthy land supply with deliverable sites of various sizes controlled by a wide range of house-builders across a good range of locations.

It is therefore considered that a range of housing requirements should be considered based on the Inspector's conclusions and more recent official Household Projections.

Inspector's conclusions (December 2014) - 580; plus 5% = 609; plus 20% = 696

2012 based Household projections plus 10% - 557; plus 5% = 585; plus 20% = 668

The Housing Trajectory is a way of showing past and future housing performance by identifying the predicted provision of housing over a period of time.
The housing trajectory is illustrated in Diagram 1.
The annual number of completions since 2011 is shown in Table 1.
The predicted number of completions for the next 5 years is shown in Table 2.
All the sites in the trajectory are considered developable; they are in suitable locations for housing development, are available for development, and are viable at the point envisaged. The Council undertakes an annual assessment of the sites to identify as at 31 March 2015 the number of dwellings built during 2014/15, the outstanding number of dwellings with planning permission and whether the site is under construction or not started, and identifies those sites without planning permission which are considered deliverable including sites where there is a resolution to grant planning permission subject to a S106. The status of each site is shown in
The trajectory shows how the number of completions since 2011 have fallen below the requirement. This undersupply is planned to be met within the following 5 years.
This 5-year land supply is wholly retrospective, using a base date of 31 March 2015 and only uses known data i.e. actual completions and actual planning permissions.

Statement of 5-year Land Supply in Uttlesford 2014/15 – 2018/19

Paragraph 47 of the National Planning Policy Framework requires local authorities to identify and update annually a supply of specific deliverable sites sufficient to provide five years worth of housing against their housing requirements with an additional buffer of 5% (moved forward from later in the plan period) to ensure choice and competition in the market for land. Where there has been a record of persistent under delivery of housing, local planning authorities should increase the buffer to 20% (moved forward from later in the plan period) to provide a realistic prospect of achieving the planned supply and to ensure choice and competition in the market for land.

The 5 year period covers the period 2015/16 to 2019/20.

Appendix 1 lists, in order by Parish, all the sites which are considered to provide housing during the period up to 2033. It includes an allowance for windfall sites of 50 dwellings per year based on historic rates of completions on windfall sites and the policy context in which they are likely to continue to be provided at this rate. All sites for 6 or more dwellings are individually listed. There are 9 categories of site. The current trajectory does not inlcude

1. under construction
2. with planning permission (full or reserved matters covering whole site)
3. with outline permission with part(s) covered by reserved matters
4. with outline only
5. where full, outline or reserved matters at post committee resolution subject to S106 negotiations
6. with application submitted
7. with pre-application discussions occurring
8. allocation only.
9. draft allocation

Site	UTT reference	Date of Permission	Capacity (Gross)	11/12	12/13	13/14	14/15	Re 15/16	Yr1 16/17	Yr2 17/18	Yr3 18/19	Yr4 19/20	Yr 5 20/21	6 21/22	7 22/23	8 23/24	9 24/25	10 25/26	11 26/27	12 27/28	13 28/29	14 29/30	15 30/31	16 31/32	17 32/33	Status	o/s at April 2016	PDL/G
Small sites(< 6 Units) with PP				99	62	68	70	114																			
Windfall Allowance									50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50		850	
Aythorpe Roding: Windmill Works	UTT/14/0779	Nov-14	11					11																	Built	0	
Birchanger 300 Birchanger Lane	UTT/1527/09/DFO	built	9	9																					Built	0	PDL
Clavering: Jubilee works	UTT/13/3357/DFO	26-Sep-14	23				2	21																	Built	0	PDL
Clavering: Land south of Oxleys Close	UTT/15/2606/DFO	13-Jan-14	13							13															3	13	G
Clavering: Land to the rear of the shop and Oxleys Close	UTT/2251/11/FUL	07-Aug-12	14					14																	Built	0	G
Elsenham: Elsenham Nurseries, Stansted Road	UTT/14/2991/OP	02-Dec-15	40								20	20													3	40	G
Elsenham: Former Goods Yard, Old Mead Lane	UTT/12/6116/FUL	07-Feb-14	10							10															1	10	PDL
Elsenham: Hailes Wood	UTT/13/2917/FUL UTT/15/2621/FUL	01/07/2014 8 Dec 2015	35					9	25																1	25	G
Elsenham: Land at Alsa Leys	UTT/13/2836/FUL	12-Mar-14	6							6															1	6	G
Elsenham: Land north Stansted Road	UTT/14/3279/DFO	01-May-15	155					-1	25	30	50	50													1	155	G
Elsenham: Land south Stansted Road	UTT/13/1790/OP	23-Dec-13	165						25	30	55	55													1	165	G
Elsenham: Land west of Hall Road	UTT/13/0177/OP	19-Dec-13	130								40	45	45												3	130	G
Elsenham: The Orchard	UTT/1500/09/OP UTT/2166/11/DFO	25/11/2010 10 August 2012	51			44	7																		Built	0	G
Felsted: Former Ridleys Brewery, Hartford End	UTT/15/0726/FUL	14-Jan-16	22								22														1	22	PDL
Felsted: Land East of Braintree Road	UTT/14/2591/DFO	01-Dec-14	25						25																1	25	G
Flitch Green: Land at Webb Road, Hallett Road	UTT/13/1123/FUL	Jul-13	9					9																	Built	0	PDL
Flitch Green: Land off Tanton Road	UTT/15/2089/DFO	Dec-15	98							25	25	24	24												1	98	G
Flitch Green: Village Centre, Land at Webb Road and Hallett Road	UTT/14/3357/FUL	15-Oct-15	25								25														2	25	PDL
Great Canfield: Canfield Nursery, Bullocks Lane	UTT/15/1732/FUL	20-Oct-15	7									7													2	7	G
Great Chesterford: land north of Bartholomew Close	UTT/14/0425/OP	Oct-14	14								14														3	14	G
Great Chesterford: Land south of Stanley Road	UTT/12/5513/OP UTT/13/3444/DFO	12 July 2013; 13 February 2014	50				41	9																	Built	0	G
Great Chesterford: New World Timber and Great Chesterford Nursery, London Road	UTT/14/0174/FUL	Dec-14	42								21	21													2	42	G/PDL
Great Dunmow: Canada Cottages	UTT/14/0787/OP	Sep-14	7									7													3	7	PDL
Great Dunmow: Kings Head, North Street	UTT/15/1544/FUL	Jul-15	6								6														2	6	PDL
Great Dunmow: Land adjacent Tower House, St Edmunds Lane	UTT/15/2425/FUL	Oct-15	7						7																1	7	G
Great Dunmow: Land East of St Edmunds Lane	UTT/14/0472/OP	May-15	22							2	5	5	5	5											3	22	G
Great Dunmow: Land west of Chelmsford Road	UTT/13/1684/OP	04-Nov-14	370							20	50	50	50	50	50	50	50								2/3	370	G

Great Dunmow: Melville House, High Street	UTT/15/0293/P3JPA	Mar-15	7						7																	1	7	PDL	
Great Dunmow: west of Woodside way	UTT/13/2107/OP	22-Oct-15	790								50	50	50	60	60	60	60	60	60	60	60	60	60	40		3	790	G	
Great Easton: The Moat House Dunmow Road Care home	UTT/0874/11	29/07/2011	26				26																			Built	0	PDL	
Gt Dunmow 37-75 High St	UTT/1185/02/FUL	Built	51	7																						Built	0	PDL	
Gt Dunmow 39 Causeway and land r/o 37& 41-49 The Causeway	UTT/0601/08/Ful	built	7	7																						Built	0	G	
Gt Dunmow Chequers Inn	UTT/1200/02/ful	Built	8	8																						Built	0	PDL	
Gt Dunmow rosemary lane infants school	UTT/1006/10	built	31	31																						Built	0	PDL	
Gt Dunmow Waldgrooms	UTT/0644/09/FUL	built	6	6																						Built	0	PDL	
Gt Dunmow: 14 Stortford Road, Perkins Garage	UTT/12/5270/FUL	08-Oct-13	12								12															2	12	PDL	
Gt Dunmow: Barnetston Court	UTT/1519/12/FUL	19-Apr-13	10				5	5																		1	0	PDL	
Gt Dunmow: Brick Kiln Farm	UTT/13/0847/OP UTT/14/0265/DFO	11 July 2013 4 June 2014	68					-2	34	34																1	68	G	
Gt Dunmow: Former Council Offices, 46 High Street	UTT/2116/10	Built	10		8	2																				Built	0	PDL	
Gt Dunmow: Land Adj Harmans Yard	utt/0912/10/ful	12-Jul-13	6			6																				Built	0	PDL	
Gt Dunmow: North of Ongar Road	UTT/1147/12/OP	01-Jan-13	73								22	22	29													3	73	G	
Gt Dunmow: South of Ongar Road	UTT/14/0127/FUL	03-Dec-15	99								24	25	50													2	99	G	
Gt Dunmow: Springfields	UTT/1412/09	Built			25																					Built	0	G	
Gt Dunmow: Woodlands Park Sectors 1 - 3	UTT/1006/04; UTT/1809/02; UTT/0395/05; UTT/0496/05; UTT/0386/05; UTT/0392/05; UTT/0246/07; UTT/13/1600	ranges between 26 November 1992 - July 2013	1633	24	23	22	43	42	40	40	40	40	40	50	50	50	50	50	50	50	50	50	50			1	700	G	
Hatfield Heath: Broomfield	UTT/12/5349/FUL	Oct-13	14				14																			Built	0	G	
Hatfield Heath: The Stag Inn,	UTT/13/2499/FUL	Nov-13	6				6																			Built	0	PDL	
Henham: Elsenham Goods Yard (north)	UTT/15/0362/FUL	30-Jul-15							6																	1	6	PDL	
Henham: land north of Chickney Road and west of Lodge Cottages	UTT/14/0065/FUL	15-May-14	16				10	6																		Built	0	G	
Henham: Land south of Chickney Road	UTT/14/2655/FUL	Jan-15	21					21																		Built	0	G	
High Roding: Meadow House Nursery	UTT/13/1767/FUL	07-Jan-14	31								15	15														2	30	PDL	
Leaden Roding: Holloway Crescent	UTT/1357/11	Built	8		-18	8																				Built	0	PDL	
Little Canfield (Takeley): Ersamine, Dunmow Road, Little Canfield	UTT/14/0122/FUL	Sep-14	15					14																		Built	0	PDL	
Little Canfield (Takeley): North View and 3 The Warren	UTT/13/1779/FUL	03-Oct-13	46				-1	21	25																	1	25	PDL	
Little Canfiled (Takeley): Priors Green Stansted Motel & 2 Hamilton Rd	UTT/0240/12/OP UTT/14/1819/FUL	03/09/2012 29/10/14	13					12																		Built	0	PDL	

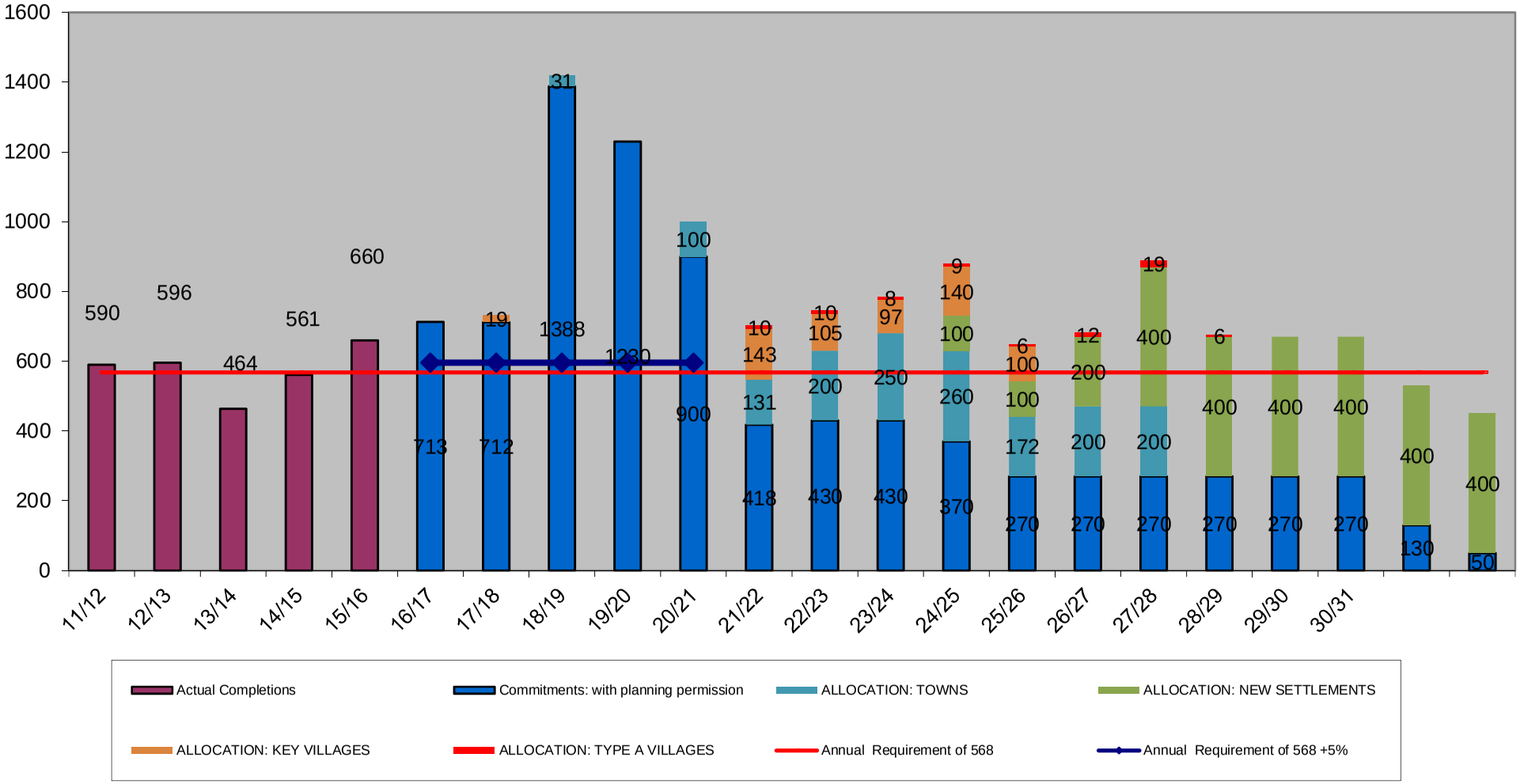
Little Dunmow: Dunmow Skips Site	UTT/13/2340/OP UTT/15/1615/DFO	27/10/2014 30 July 2015	40				-2		20	20																1	40	PDL	
Little Easton (Gt Dunmow): Woodlands Park Sector 4	UTT/2507/11/OP. UTT/13/1663/DFO	2 August 2012; 31 October 2013	125						10	28	28	29	29													1	124	G	
Little Hallingbury: Land at Dell Lane	UTT/15/1046/FUL	03-Aug-15	16							16																2	16	G	
Littlebury: Peggys Walk	UTT/1984/10	Built	14	2	12																					Built	0	PDL	
Manuden: Site off the Street	UTT/0692/12/FUL	12-Feb-13	14			9	5																			Built	0	G	
Newport : Hillside and land to rear, Bury Water Lane Retirement village (40 retirment units; 120 extra care; 5 market	UTT/13/1817/OP UTT/14/2900/DFO UTT/14/2901/DFO UTT/14/2902/DFO	30/10/2013 Dec 2014	45 + 120							5				38	60	60									3/2	163	G	
Newport: Bury Water Lane/Whiteditch Lane	UTT/13/1769/OP	29-Nov-13	84									42	42													3	84	G	
Newport: Carnation Nurseries	UTT/14/3506/DFO	Feb-15	21					20																		Built	0	G/PDL	
Newport: Land opposite Branksome, Whiteditch Lane	UTT/14/1794/OP	23-Jul	15									5	10													3	15	G	
Newport: Land south of Wyndhams Croft, Whiteditch Lane	UTT/14/3266/OP	18-Dec	15									5	10													3	15	G	
Newport: Land west of Cambridge Road	UTT/15/2364/FUL	15-Mar	34							17	17															2	34	G	
Newport: Reynolds Court, Gaces Acre	UTT/14/3655/FUL	01-Mar	41					-12	15	-19	26															1	22	PDL	
Newport: The Maltings Station Rd	UTT/1405/09	Built	11		11																					Built	0	PDL	
Quendon: land r/o Foxley House	UTT/14/3662/FUL	16-Jun-15	19						19																	1	19	G	
Radwinter: Land north of Walden Road	UTT/13/3118/OP UTT/15/1467/DFO	28/02/2014 3 August 2015	35						5	15	15															1	35	G	
S Walden Bell College Peaslands Road	UTT/0503/10	Built	86	86																						Built	0	PDL	
S Walden: Bell College South road (retirement flats)	UTT/1981/10	Built	27		27																					Built	0	PDL	
Saffron Walden: 8-10 King Street	UTT/0280/12/REN of UTT/1733/08/FUL	21-Jun-12	8						8																	1	8	PDL	
Saffron Walden: Ashdon Road	UTT/1572/12/DFO	21-Nov-12	130			22	72	36																		Built	0	G	
Saffron Walden: Bell College South Road	UTT/0828/09	Built	62	25	37																					Built	0	PDL	
Saffron Walden: Former Gas Works Thaxted Rd	UTT/0123/09	24-Mar-09	9		4	5																				Built	0	PDL	
Saffron Walden: Former Willis and Gambier Site, 119 Radwinter Road	UTT/13/1981/OP x 60 superseded by UTT/14/3182/FUL x 73	24/07/2014 Resolution to approve subject to S106	72								72															3	72	PDL	
Saffron Walden: Former Willis and Gambier Site, 121 Radwinter Road	UTT/13/3406/FUL	July 204	52					3	23	26																1	49	PDL	
SAffron Walden: Friends School	UTT/0188/10	31-Mar-11	76		30	37	7																			Built	0	PDL	
Saffron Walden: Garage Site, Catons	UTT/14/2514/FUL	01-Oct-14	6						6																	1	6	PDL	
Saffron Walden: Goddards Yard	UTT/13/0669/FUL UTT/13/2395/FUL UTT/13/2395/FUL	21/06/2013 July 2014	14				12	2																		1	0	PDL	
Saffron Walden: Land at Ashdon Road Commercial Centre	UTT/13/2423/OP	26/11/2014	167							50	50	50	17													3	167	PDL	

Saffron Walden: Land to the West of Debden Road (Tudor Works)	UTT/1252/12/OP UTT/14/0356/DFO	21/11/2012 24 July 2014	24					24																			Built	0	PDL	
Saffron Walden: Land west of 9 and 10 Everitt Road	UTT/15/1218/FUL	14-Oct-15	7							7																	2	7	G	
Saffron Walden: Lodge Farm, Radwinter Rd (Pt of Jossaumes)	UTT/12/5226/FUL	04-Jan-13	31				31																				Built	0	PDL	
Saffron Walden: Moores Garage, Thaxted Road	UTT/14/2003/FUL	03-Sep-15	10							10																	2	10	PDL	
Saffron Walden: Thaxted Rd (Kiln Court)	UTT/13/1937/OP	11-Oct-13	52								26	26															3	52	PDL	
Saffron Walden: The Sun Inn Gold Street	utt/0681/12	07-Jul-12	6			6																					Built	0	PDL	
Saffron Walden:Land south of Radwinter Road	UTT/13/3467/OP	26-May-15	200							50	50	50	50														3	200	G	
Saffron Walden:Land south of Radwinter Road for retirement village ("Extra care housing within class C2 provision" - 60 bed care home; 12 extra care bungalows; 30 extra care apartments. Trajectory excludes 60 bed car home)	UTT/13/3467/OP	26-May-15	102									12	30														3	42	PDL	
Saffron.Walden: Lt Walden Road	UTT/1576/12/DFO	15-Nov-12				15																					Built	0	G	
Stansted Mountfitchet: 68-70 Bentfield Road	UTT/2479/11/FUL	07-Feb-12	9		3	6																					Built	0	PDL	
Stansted Mountfitchet: 2 Lower Street	UTT/1522/12/FUL	07-Jan-13	14						14																		1	14	PDL	
Stansted Mountfitchet: Land at Walpole Farm	UTT/13/1618/OP UTT/15/2746/DFO	1 april 2014 15 Feb 2016	147								47	50	50														2	147	G	
Stansted Mountfitchet: Mead Court Redevelopment of 27 units with 29 units therefore net gain of 2	UTT/13/0749/FUL	06-Jun-13	29				-23		25																		1	25	PDL	
Stansted Mountfitchet: Rochford Nurseries	UTT/2265/07/DFO	28-Feb-08	663	84	148	64	35																				Built	0	G	
Stansted Mountiftchet: Land at Elms Farm	UTT/13/1959/OP	17-Jan-14	53									25	26														3	51	G	
Stebbing: land to east of Parkside and rear of Garden Fields	UTT/14/1069/OP	Feb-15	30								15	15															3	30	G	
Takeley: Brewers End Takeley	UTT/13/1393/OP UTT/14/3295/DFO	23/08/2013 Feb 2015	100					40	60																		1	60	G	
Takeley: Chadhurst Takeley	UTT/13/1518/FUL	12-Sep-13	13					-1	13																		1	13	G	
Takeley: Land adj Olivias, Dunmow Rd	UTT/12/5142/FUL	14-Dec-12	6				1	2	3																		1	3	G	
Takeley: Land South of Dunmow Road and east of The Pastures/Orchard Fields	UTT/1335/12/FUL	24-Sep-13	41				15	26																			Built	0	G	
Takeley: Land west of The Chalet, Dunmow Road	UTT/14/2387/FUL	Mar-15	10					10																			Built	0	G	
Takeley: Priors Green			792	98	162	76	32	16	2	2																	1/2	4	G	
Takeley: Priors Green,Takeley Nurseries	UTT/0515/10	Built	35	35																							Built	0	G	
Thaxted: 25 Barnards Fields	UTT/15/1959	Sep-15	9						9																		1	9	PDL	
Thaxted: Artington, Orange Street	UTT/15/1541/FUL	Sep-15	6					-1	6																		1	6	PDL/G	

Thaxted: Land East of Barnards Fields Thaxted	UTT/13/0108/OP UTT/14/2426/DFO	07/06/2013 15 October 2014	8					8																		Built	0	G		
Thaxted: Land off Wedow Road	UTT/13/1170/OP	May-14	47							15	15	17														3	47	G		
Thaxted: Sampford Road	UTT/12/5754/FUL	08-Feb-13	60				23	37																		Built	0	G		
Thaxted: Wedow Road	UTT/1562/11/OP UTT/12/5970/DFO; UTT/13/3420/OP x 4	9 december 2011; 18 February 2013; Feb 2014	59				30	25				4														3/Built	4	G		
Wendens Ambo: Mill House Royston Road	UTT/13/3474/P3JPA	24 Februrary 2014	6						6																	2	6	PDL		
Wendens Ambo: The Mill, Royston Road	UTT/14/3091/P3JPA UTT/14/3788/FUL x 1	01/12/2014 March 2015	17				2	14	1																	1/Built	1	PDL		
Wimbish: Land at Mill Road	UTT/14/1688/FUL	Mar-15	11						11																	1	11	G		
																											0			
Plan Target				568	568	568	568	568	568	568	568	568	568	568	568	568	568	568	568	568	568	568	568	568	568					
5% front loading									596	596	596	596	596																	
20% front loading									696	696	696	696																		
New Settlement A																	**50**	**50**	**100**	**200**	**200**	**200**	**200**	**200**	**200**					
New Settlement B																	**50**	**50**	**100**	**200**	**200**	**200**	**200**	**200**	**200**					
ALLOCATION: NEW SETTLEMENTS																	**100**	**100**	**200**	**400**	**400**	**400**	**400**	**400**	**400**					
Land west of Lime Avenue UTT/15/3768/FUL											31																			
04Saf15														8																
07Saf15													50	50	100	100														
11saf15																50	100	100	100	100										
13saf15														10				12												
16Saf15																														
Saffron Walden TOTAL											**31**		**50**	**68**	**100**	**150**	**100**	**112**	**100**	**100**										
06GtDun15													13																	
07GtDun15													37	63	100	100	100													
08GtDun15																			100	100										
12GtDun15																	60	60												
Great Dunmow TOTAL											**0**		**50**	**63**	**100**	**100**	**160**	**60**	**100**	**100**										
ALLOCATION: TOWNS											**31**		**100**	**131**	**200**	**250**	**260**	**172**	**200**	**200**										
Elsenham 08Els15														**30**																
Great Chesterford 05GtChe15 UTT/15/2310/OP granted PP														**30**																
UTT/15/0879/OP														12																
02/03New15 UTT/16/1290/OP decision pending														12																
06New15 UTT/15/1869/FUL decision pending															47	47														
Newport TOTAL														**24**	**47**	**47**														
09Sta15																	40													
26Sta15															10															
Stansted Mountfitchet TOTAL															**10**		**40**													
Land north of Dunmow Road / East of Church Street (UTT/15/2424/FUL)										7																				
Land at Dunmow Road, Little Canfield (UTT/16/0270/FUL)										12																				
02LtCan15 (UTT/16/1022/FUL PP for 5 dwellings)															10															
03HBO15 / 02HBO15														30	30	50	100	100												
Takeley / Lt Canfield / HBO TOTAL										**19**				**30**	**40**	**50**	**100**	**100**												
10Tha15 (UTT/16/0171/FUL granted PP)														29																
14Tha15															8															

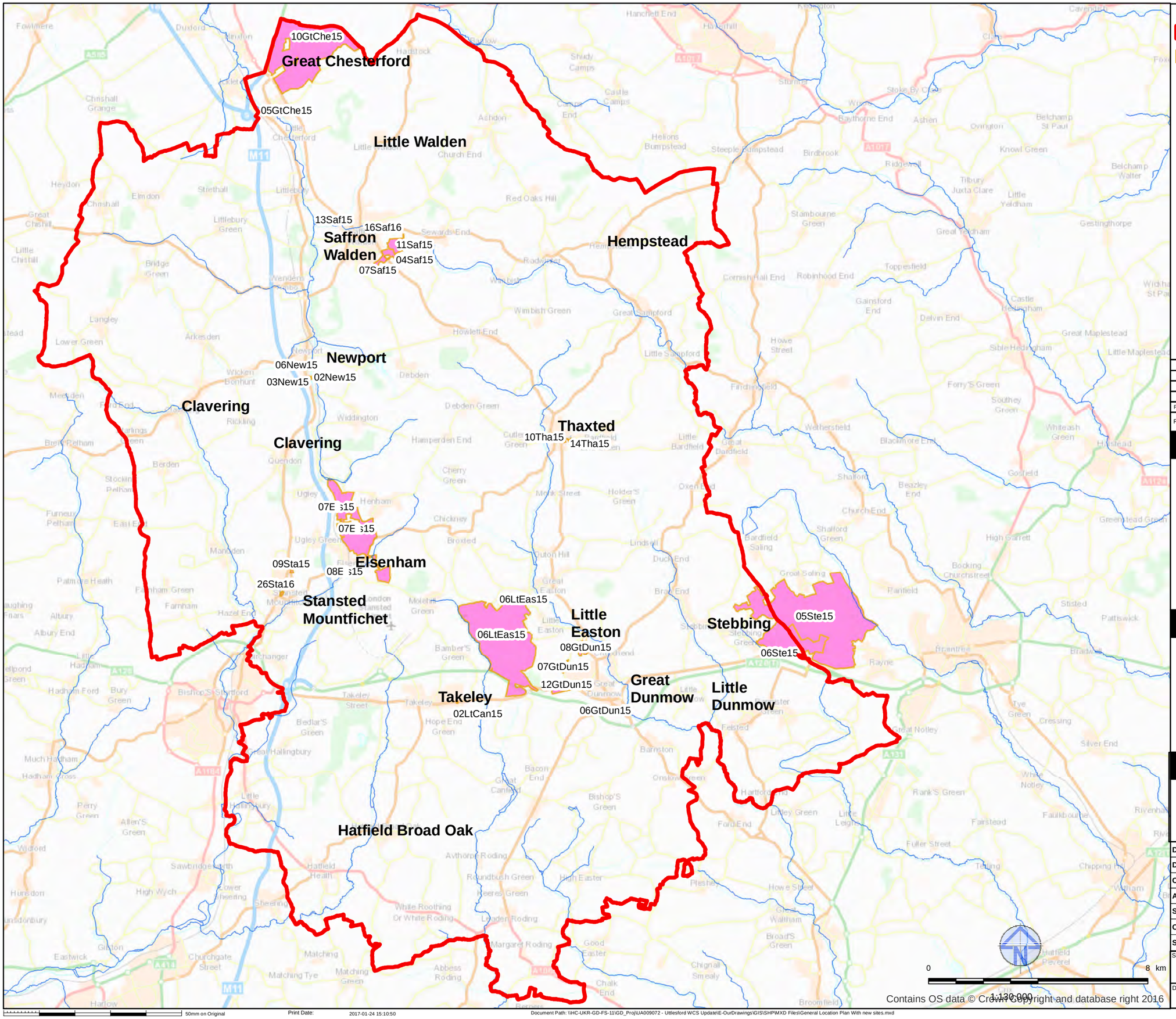
Thaxted TOTAL											**0**				**29**	**8**															
ALLOCATION: KEY VILLAGES											**19**				**143**	**105**	**97**	**140**	**100**												
ALLOCATION: TYPE A VILLAGES															**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**									
											19	31	0	100	284	315	357	510	382	410	610	410	400	400	400	400	5028				

Diagram 1: - HOUSING COMPLETIONS AND TRAJECTORY 2011 TO 2033



APPENDIX D

Mapping



Legend:

- Uttlesford District Boundary
- Uttlesford WCS Sites

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:

Water Cycle Study Update General Plan

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Uttlesford District General Location Plan of Proposed Sites

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:

Stakeholder Discussion

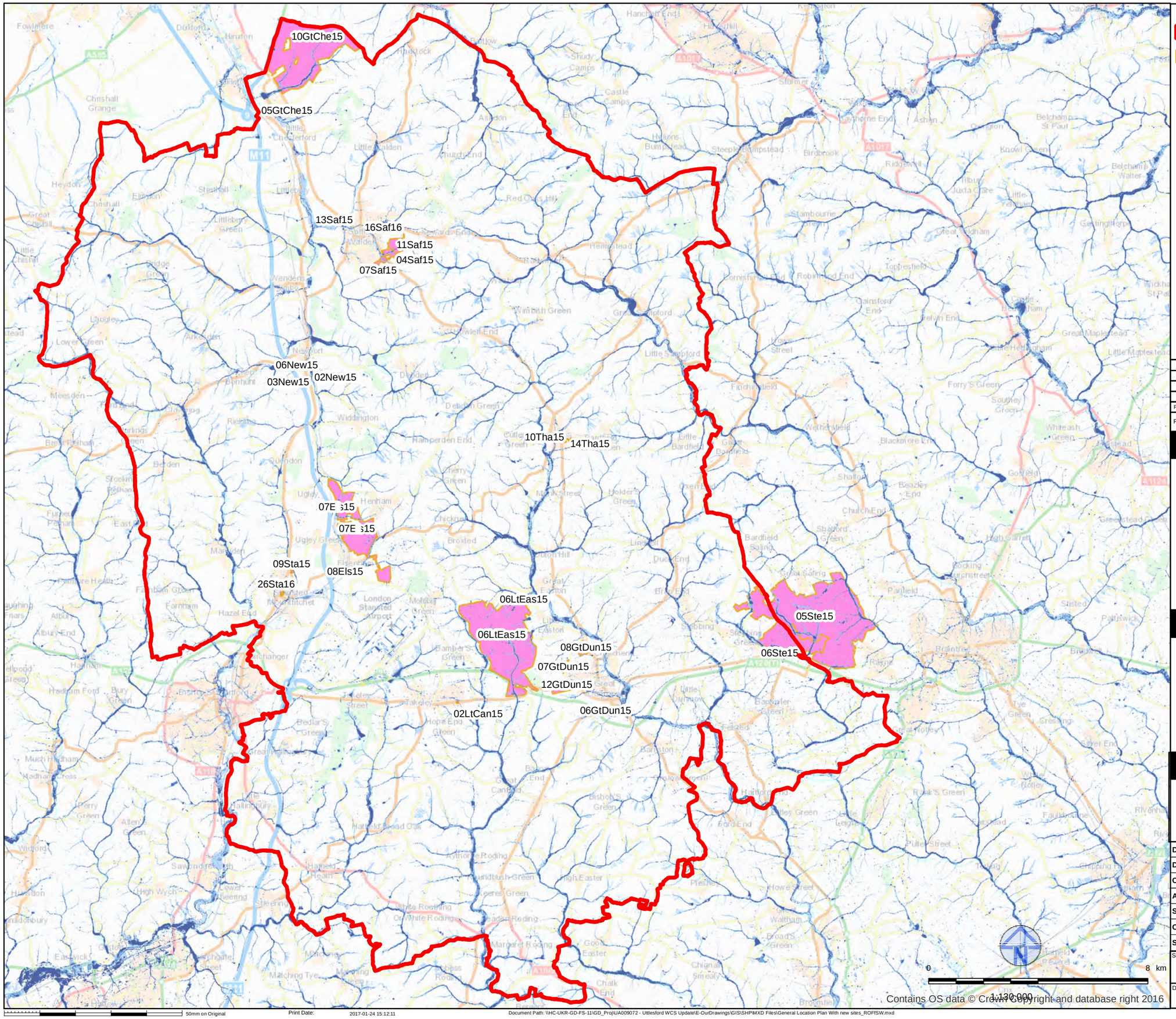
Drawing Number: 4012-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 15:10:50

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\General Location Plan With new sites.mxd



Legend:

- Uttlesford District Boundary
- Uttlesford WCS Sites
- Risk of Flooding from Surface Water Extent: 3.3 percent
- Risk of Flooding from Surface Water Extent: 1 percent
- Risk of Flooding from Surface Water Extent: 0.1 percent

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:
Water Cycle Study Update General Plan

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Uttlesford District General Location Plan of Proposed Sites

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:
Stakeholder Discussion

Drawing Number: 4011-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 15:12:11

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\General Location Plan With new sites_ROFfSW.mxd

Legend:

- Thames WwTW
- Anglian SPS
- AnglianSPS_Buffer5
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

0 0.2 km

1:3,810

50mm on Original

Print Date: 2017-01-24 15:06:25

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\Thaxted_01.mxd

Uttlesford District Council

PROJECT:

Water Cycle Study Update Thaxted

Uttlesford District Council
Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Thaxted

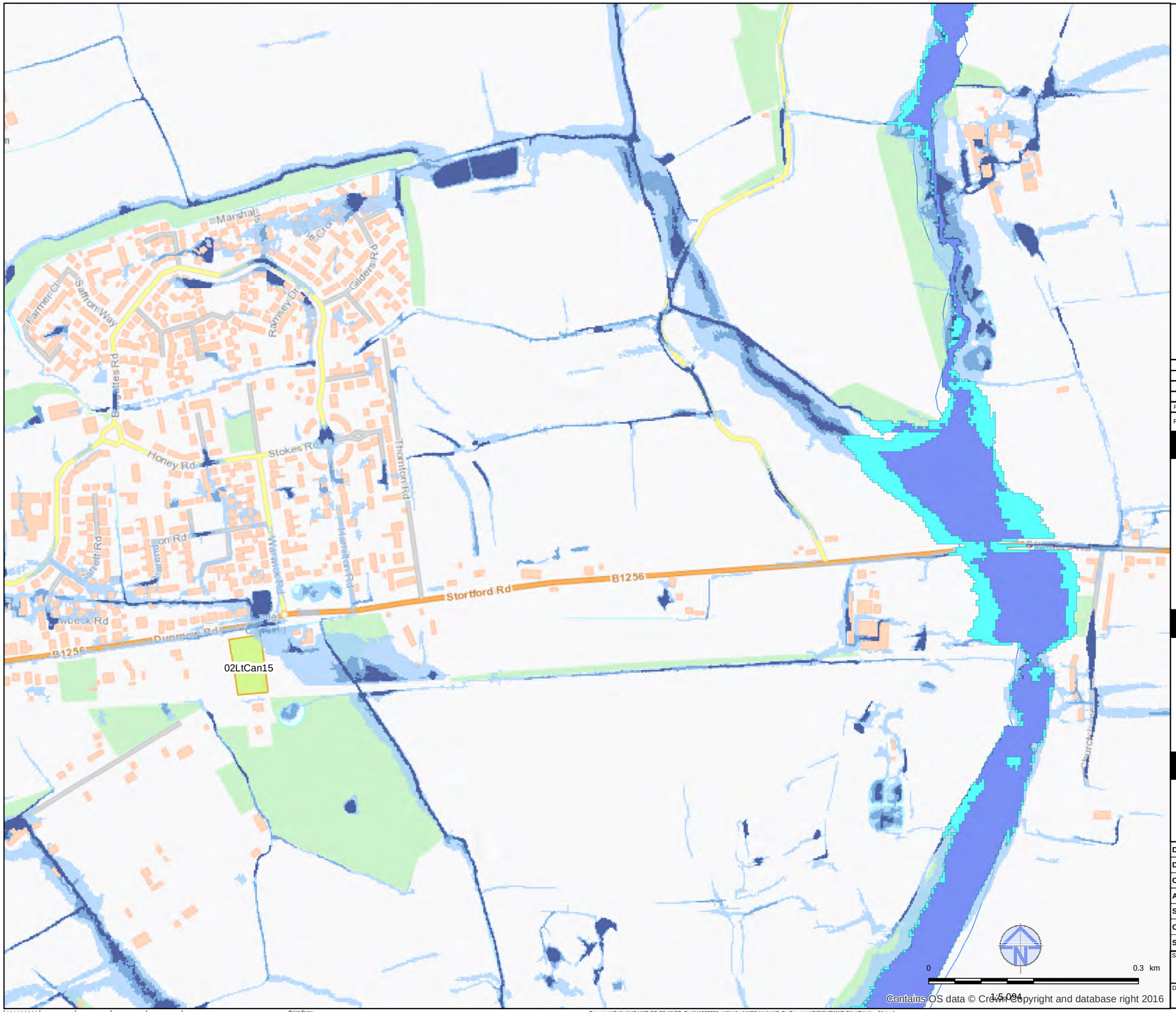
Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:

Stakeholder Discussion

Drawing Number: 4010-UA009072-UU41D-01

Revision: P01



Legend:

- Thames WwTW
- Anglian SPS
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian SPS 15m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:

Water Cycle Study Update Takeley

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
ucomnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Takeley

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:

Stakeholder Discussion

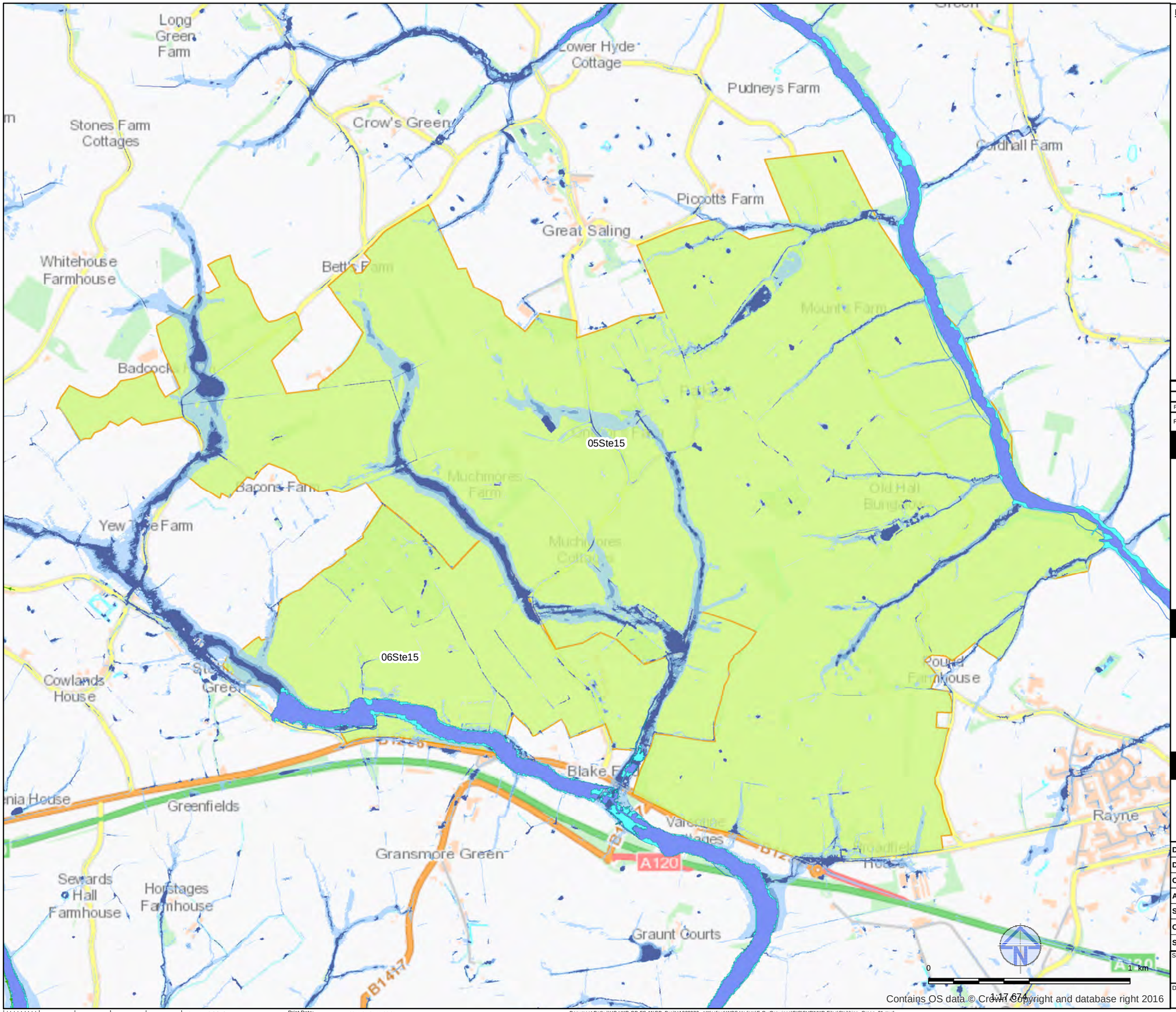
Drawing Number: 4009-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 15:15:03

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\Takeley_01.mxd



NOTES:

Legend:

- Thames WwTW
- Anglian SPS
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian SPS 15m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:
Water Cycle Study Update
Stebbing Green

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Stebbing Green

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:
Stakeholder Discussion

Drawing Number: 4008-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 15:00:25

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\Stebbing_Green_01.mxd

Legend:

- Thames WwTW
- Anglian SPS
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian SPS 15m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

PROJECT:

Water Cycle Study Update Stansted

Uttlesford District Council

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Stansted

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:
Stakeholder Discussion

Drawing Number: 4007-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 14:58:14

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\Stansted_01.mxd

Legend:

- Thames WwTW
- Anglian SPS
- AnglianSPS 15m Buffer
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:
Water Cycle Study Update
Saffron Walden
Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Saffron Walden

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:
Stakeholder Discussion

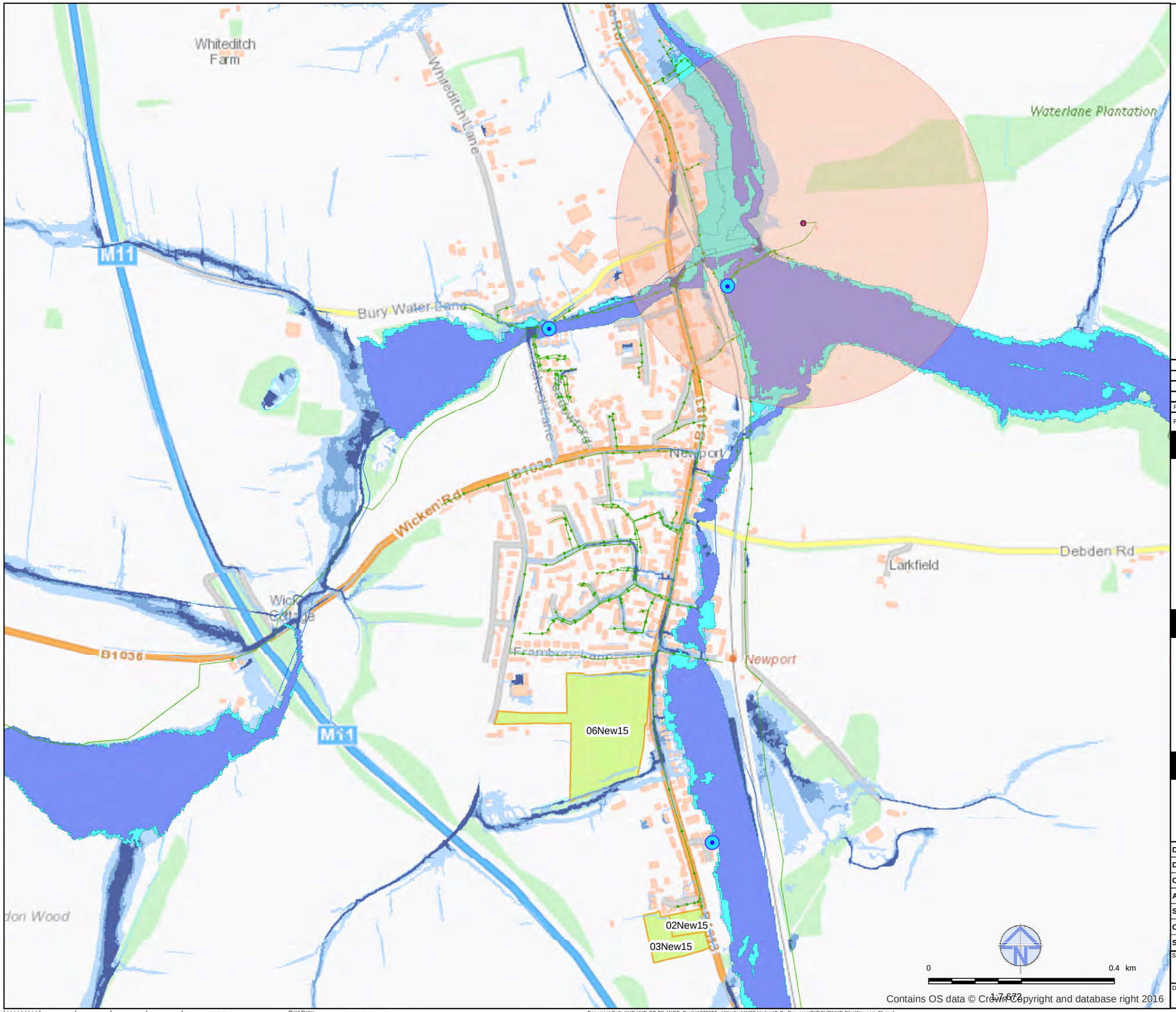
Drawing Number: 4006-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 14:55:37

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\Saffron_Walden_01.mxd



Legend:

- Thames WwTW
- Anglian SPS
- AnglianSPS 15m Buffer
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:

Water Cycle Study Update Newport

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Newport

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:

Stakeholder Discussion

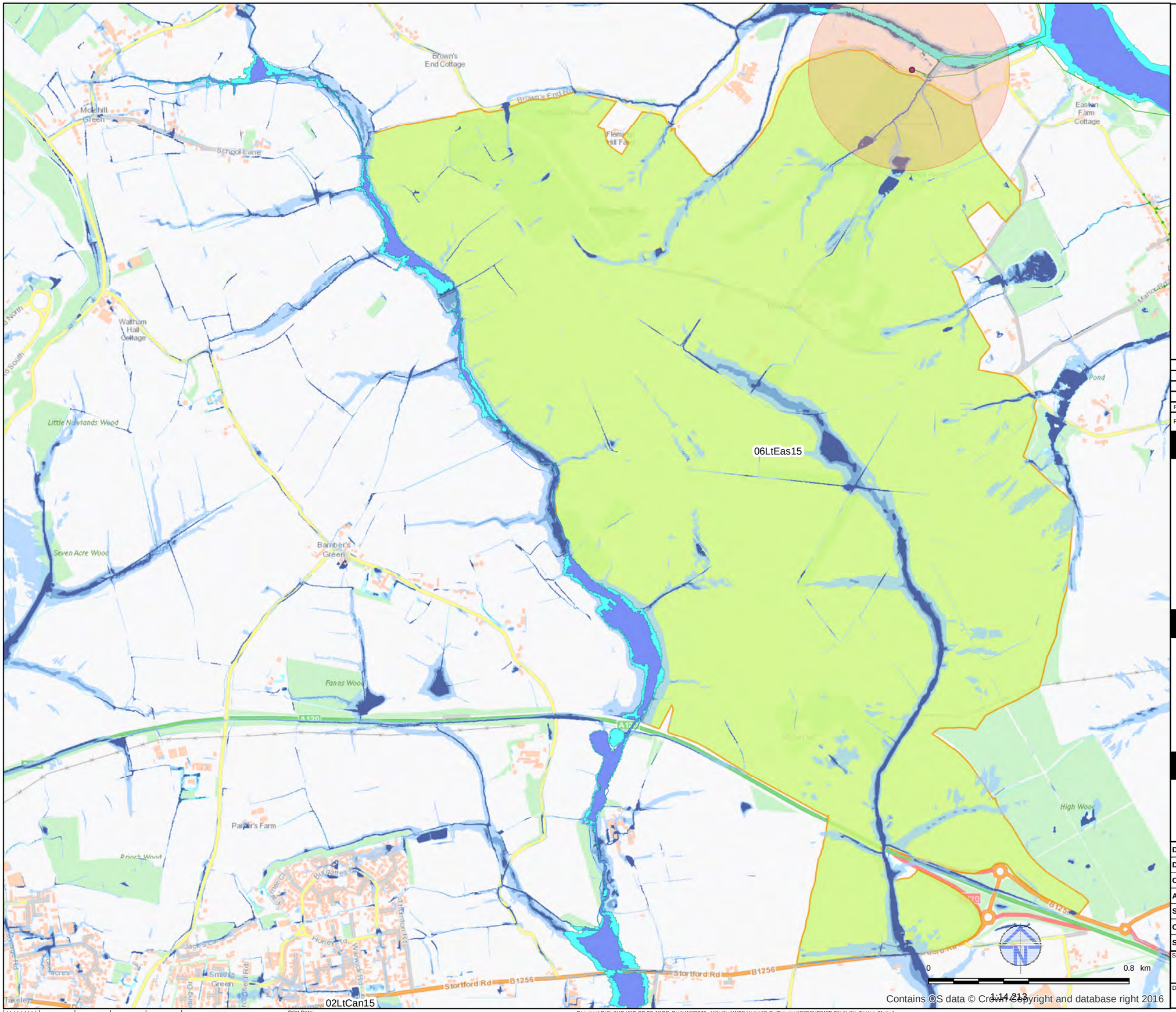
Drawing Number: 4005-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 14:53:25

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\Newport_01.mxd



Legend:

- Thames WwTW
- Anglian SPS
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian SPS 15m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:

Water Cycle Study Update
Little Easton

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Little Easton

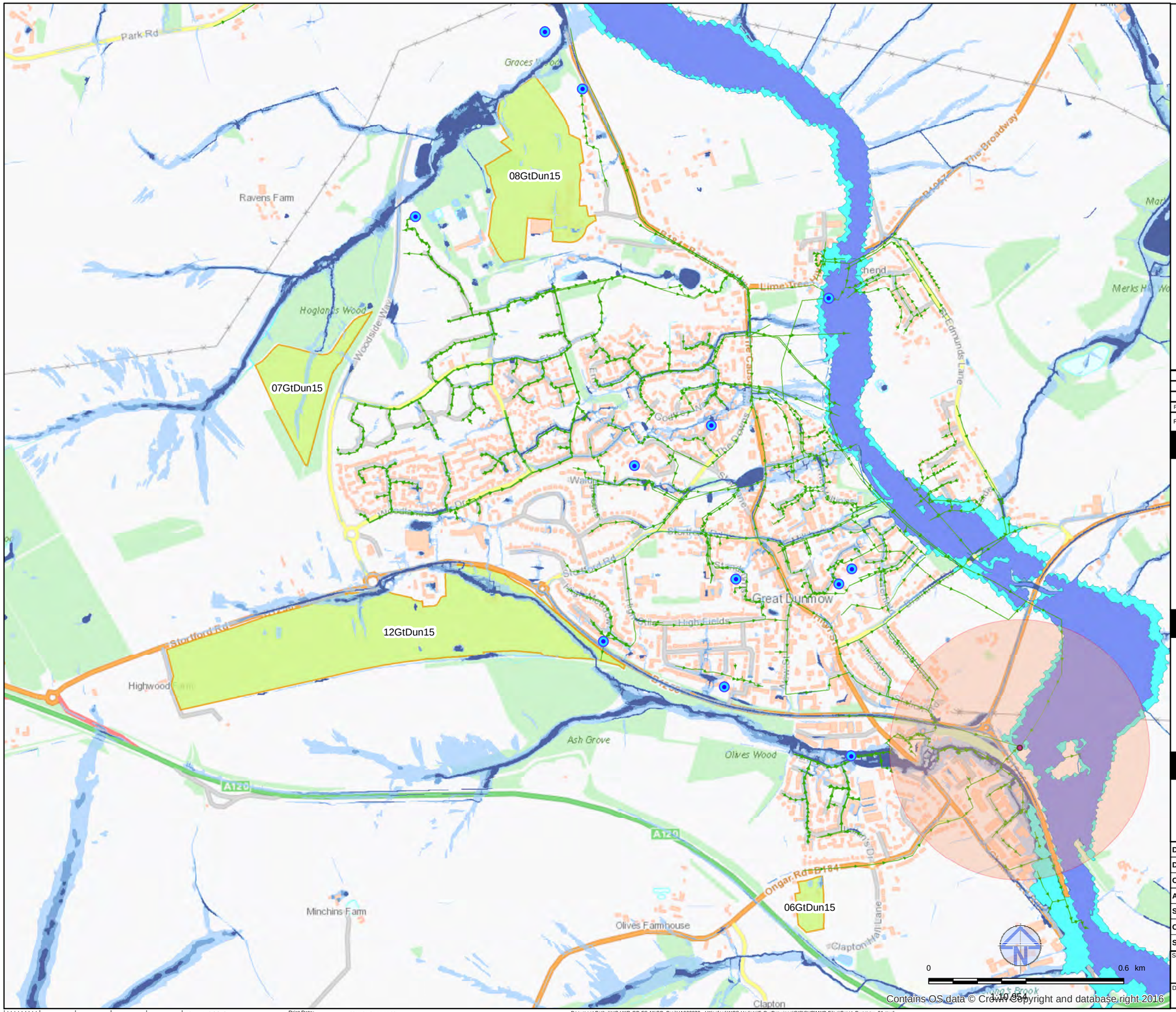
Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:

Stakeholder Discussion

Drawing Number: 4004-UA009072-UU41D-01

Revision: P01



Legend:

- Thames WwTW
- Anglian SPS
- AnglianSPS 15m Buffer
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:

Water Cycle Study Update Great Dunmow

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Great Dunmow

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:

Stakeholder Discussion

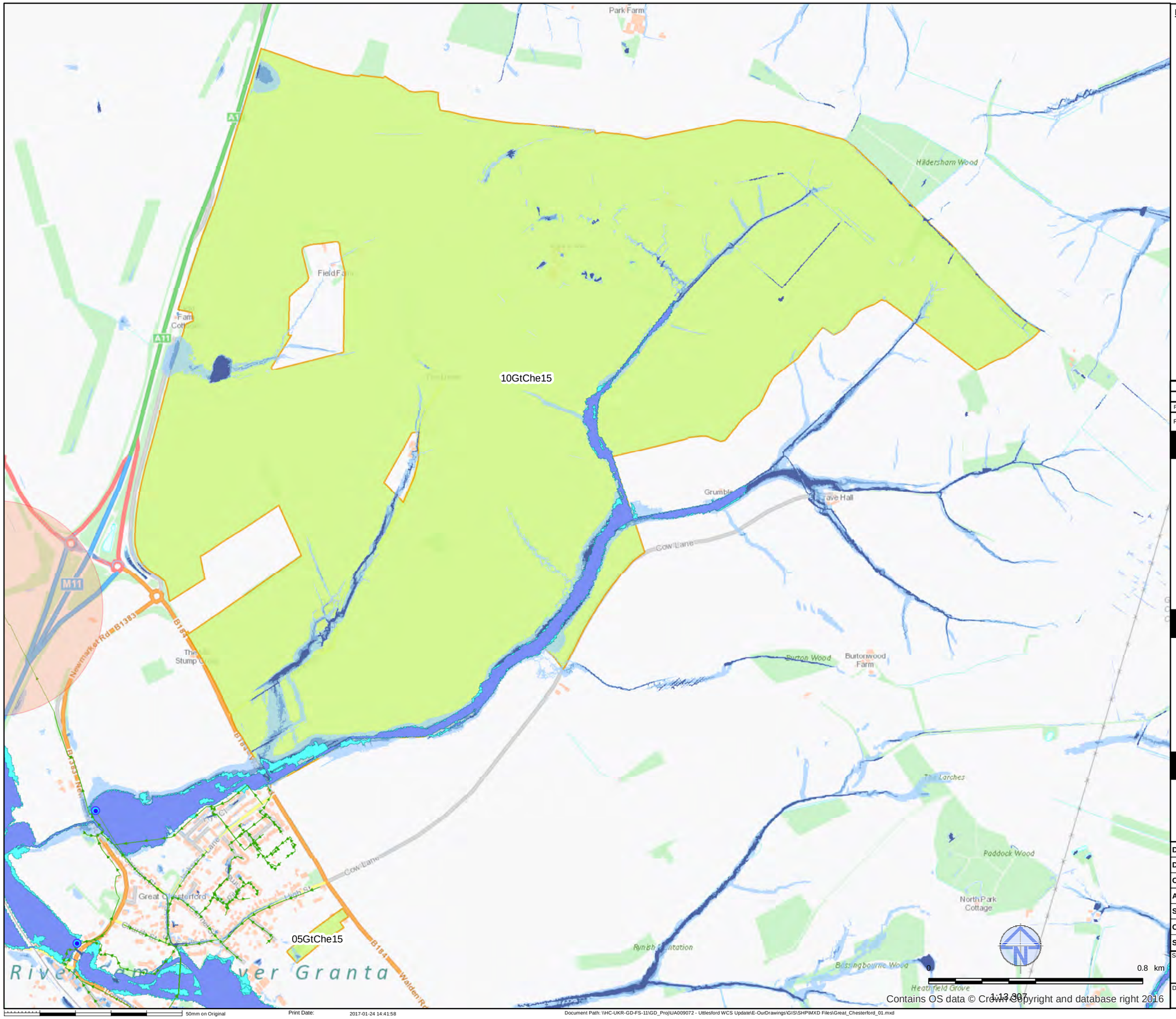
Drawing Number: 4003-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 14:47:08

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\Great_Dunmow_01.mxd



NOTES:

Legend:

- Thames WwTW
- Anglian SPS
- AnglianSPS 15m Buffer
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:

Water Cycle Study Update
Great Chesterford

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Great Chesterford

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:

Stakeholder Discussion

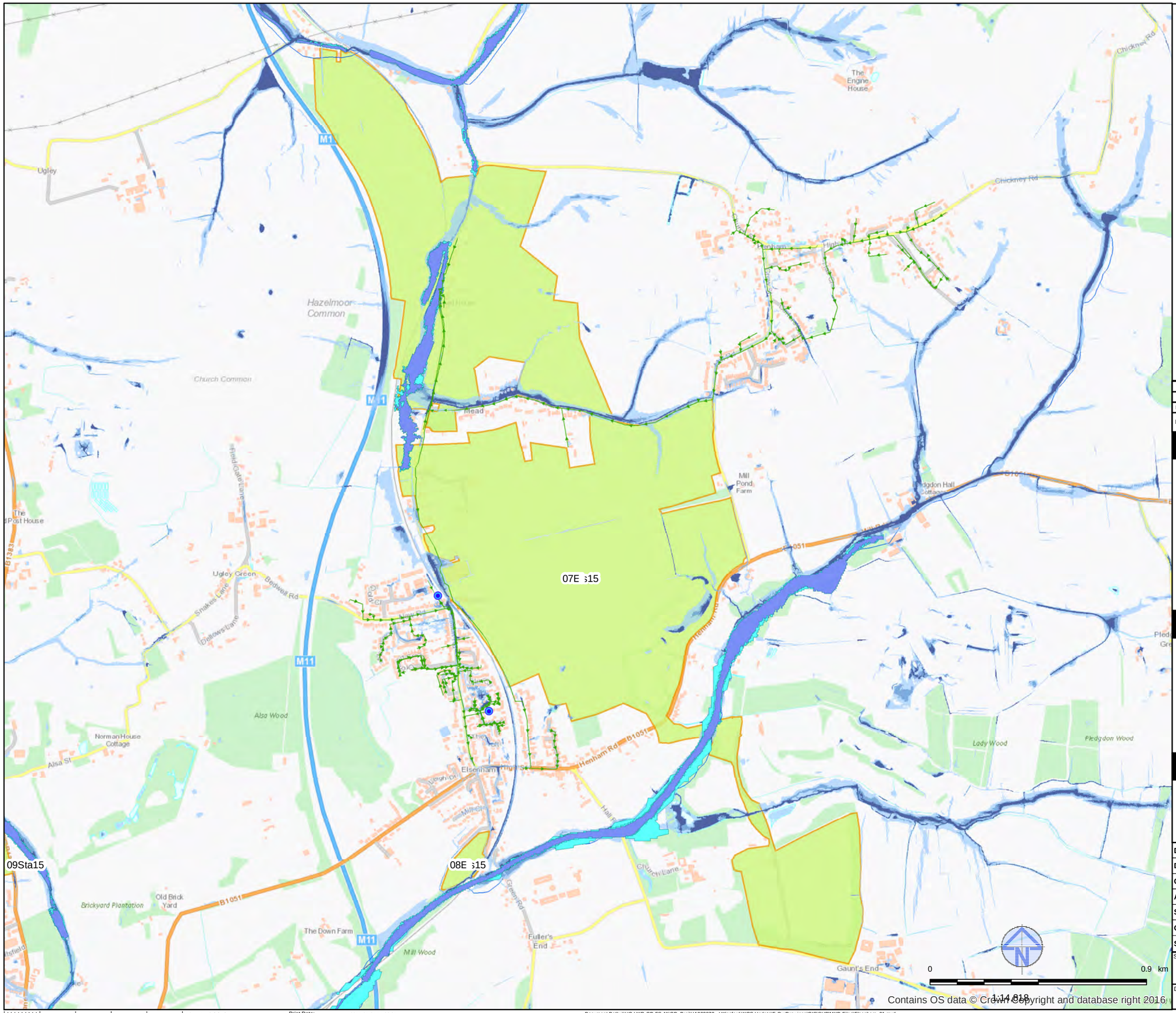
Drawing Number: 4002-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 14:41:58

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHP\MXD Files\Great_Chesterford_01.mxd



NOTES:

Legend:

- Thames WwTW
- Anglian SPS
- AnglianSPS 15m Buffer
- ThamesWwTW 400m Buffer
- Anglian WwTW 400m Buffer
- Anglian WwTW
- Anglian Sewers
- Uttlesford WCS Sites
- uFMfSW 1 in 30 flood event
- uFMfSW 1 in 100 flood event
- uFMfSW 1 in 1000 flood event
- WFD - River Waterbodies
- SPA England
- SAC England
- Flood Zone 2 Map for Planning
- Flood Zone 3 Map for Planning

REV	Date	Description	Drawn	Check	Approv
P01	24/01/2017	Draft Issue	DS	TR	AH

Uttlesford District Council

PROJECT:

Water Cycle Study Update Elsenham

Uttlesford District Council

Uttlesford District Council
Council Offices
London Road
Essex CB11 4ER
Phone +44(0)1790 510510
Fax +44(0)1790 510550
uconnect@uttlesford.gov.uk
www.uttlesford.gov.uk

ARCADIS Design & Consultancy for natural and built assets

Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
Unit 17 Innovation Centre
Bridge of Don
Aberdeen AB23 8GX
Tel: 44 (0)1224 822494

www.arcadis.com

TITLE:

Infrastructure Constraints

Elsenham

Designed	D. Scard	Date 24JAN17	Signed
Drawn	D. Scard	Date 24JAN17	Signed
Checked	T. de la Rosa	Date 24JAN17	Signed
Approved	A.Hart	Date 24JAN17	Signed
Scale:	As shown	Datum:	NEWLYN
Original Size:	A3	Grid:	OS
Suitability Code:	Sx	Project Number:	UA009072

Suitability Description:

Stakeholder Discussion

Drawing Number: 4001-UA009072-UU41D-01

Revision: P01

50mm on Original

Print Date: 2017-01-24 14:23:35

Document Path: \\HC-UKR-GD-FS-11\GD_Proj\UA009072 - Uttlesford WCS Update\E-OurDrawings\GIS\SHPMXD Files\Elsenham_01.mxd

Uttlesford District
Water Cycle Study

Arcadis Consulting (UK) Limited

The Surrey Research Park
10 Medawar Road
Guildford
GU2 7AR
United Kingdom

T: +44 (0)1483 803 000

arcadis.com