

South Holland, South Kesteven and Rutland Water Cycle Study **Key Constraints Assessment**

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Prepared for



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Explanatory note

Please note, this Key Constraints Assessment represents an interim point in the assessment process and as such has been largely superseded by the later Technical and Planning Reports. Differences between this report and the Technical and Planning Reports are therefore apparent, particularly regarding the assessment locations; at the time of writing this Key Constraints Assessment the growth locations had not been determined. Therefore, it was felt that to fully update this Key Constraints Assessment would not only be unnecessary (as it is largely superseded), but would also not give the client group the record of the stages in the assessment process.

1 Introduction

At this stage in the Water Cycle Study, the key development locations and proposed housing numbers have not been confirmed, therefore in order to carry out the preliminary Key Constraints assessment, the three Districts have been divided according to the main settlements and therefore assumed likely growth locations. The locations are shown below in sections 1.3 to 1.5, along with the assessment outcomes. The study area and Council boundaries are shown below in Figure 1.

The assessment has been carried out on the 5 key 'water cycle' topic areas:

- water resources;
- wastewater treatment and transmission;
- ecology;
- flood risk; and
- surface water management and SuDS potential.

1.1 Methodology

1.1.1 Water resources

The assessment of water resources has included a review of the Environment Agency's Catchment Abstraction Management Strategies (CAMS) and Anglian Water Services' (AWS) and Severn Trent Water Limited's (STWL) Resource Management Plans (WRMP). The CAMS document looks at the environmental capacity of the available water resources, by assessing the environmental impact of existing surface and groundwater abstractions and making a judgement as to whether further abstraction would be acceptable. The WRMPs extend the assessment to include the capacity of water treatment and transmission infrastructure to supply water of drinking water quality to the required locations. The WRMPs also give the water companies' proposals to increase available resources or provide sufficient efficiencies to meet future water resource demand. Including available water to be abstracted (CAMS) and available water to be supplied (WRMP).

1.1.2 Wastewater treatment and transmission

The wastewater assessment addresses two key areas for wastewater: the baseline with respect to treatment of wastewater and how much 'spare' capacity is available in existing wastewater treatment facilities; and, the baseline with respect to wastewater or sewer network and whether there is scope to use the existing and/or planned network system before upgrades are required.

Baseline volumetric capacity at the wastewater treatment works has been assessed by comparing the consented Dry Weather Flow (DWF) with the measured DWF. Several of the wastewater treatment works (WwTW) serving the outlying settlements have new proposed DWF consents; these variations relate to the current flow at the works (and seasonal variations) and do not consider growth. These works can therefore be considered to be operating at their consented DWF limit and further variations will be required to treat additional flows. Further assessment will be carried out once individual growth sites are known.

At this point, as the development locations are not known, it is not feasible to assess constraints in the sewerage entire network as this would likely be abortive work when preferred options change. The infrastructure assessment will therefore be carried out later in the WCS process, once development locations have been established. The main WwTW and the current volumetric capacities are shown in Table 1 below and Figure 2. Please note, household figures have been rounded to the nearest 50.

Table 2: WwTW volumetric capacities

Treatment works	Current DWF consent	Proposed DWF consent	Measured flow	TSS	BOD	NH4	Current DWF capacity (m3/day)	Current DWF capacity (households)
COTTESMORE STW	1,100	1,422	1,187	15	10A	5	0	0
EMPINGHAM STW	700	No Change	86	40	20A	5	614	2,339
GREAT CASTERTON STW	115	No Change	69	60	40A	12	46	174
KETTON STW	620	No Change	231	100	50A	-	389	1,482
NORTH LUFFENHAM STW	399	447	262	35	17A	8	0	0
OAKHAM STW	2,962	No Change	1,288	60	40A	20	1,674	6,379
RYHALL STW	450	496	430	40	25A	10	0	0
UPPINGHAM STW	990	No Change	746	40	20A	-	244	928
CROWLAND STW	830	No Change	738	60	40A	20	92	349
DONINGTON STW	410	540	186	60	45A	-	0	0
HOLBEACH STW	1,910	No Change	1,196	60	40A	-	366	1,393
SPALDING STW	15,720	No Change	7,840	120	60A	-	7,880	30,019
SUTTON BRIDGE STW	3,247	No Change	1,340	230	230A	-	1,907	7,265
BOURNE STW	6,210	6,143	4,780	20	10A	3	0	0
COLSTERWORTH STW	360	No Change	183	40	25A	10	177	674
DEEPING STW	3,236	5,370	4,380	40	25A	18	0	0
LONG BENNINGTON STW	639	No Change	299	90	60A	30	340	1,295
HORBLING STW	500	878	610	40	15A	15	0	0
SOUTH WITHAM STW	285	372	184	50	30A	-	0	0

Treatment works	Current DWF consent	Proposed DWF consent	Measured flow	TSS	BOD	NH4	Current DWF capacity (m3/day)	Current DWF capacity (households)
MARSTON STW	14,300	15,904	13,314	15	10A	3	0	0
LITTLE BYTHAM	380	1,189	624	15A	30	15	0	0
CAYTHORPE	360	No change	186	15A	30	-	174	663
LANGHAM	299	No Change	248	45	25	15	51	194
MARKET OVERTON	143	No Change	74	45	25	15	69	263

1.1.3 Ecology

Information regarding Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar Sites and Sites of Special Scientific Interest (SSSIs) has been supplied by Natural England. Information regarding locally designated sites, such as Local Nature Reserves (LNRs), has been supplied by Rutland County Council, South Kesteven District Council and the Lincolnshire Biodiversity Partnership on behalf of South Holland District Council. The designated conservation sites are shown in Figure 3.

1.1.4 Flood risk

Review of the Environment Agency's flood mapping (www.environment-agency.gov.uk) and the SFRAs for each council demonstrate that there are large areas at risk of flooding, especially from tidal sources. A high level assessment of the flood risk to each individual settlement is given in sections 1.3 to 1.5 below

1.1.5 Surface water management and SuDS potential

The potential for the use of Sustainable Drainage Systems (SuDS) is largely dependent on the underlying geology. Where there are permeable soils, infiltration SuDS can be recommended, but where a sites lies over impermeable geology, such as clay, surface water run off will need to be discharged to a surface watercourse. Attenuation should therefore be applied to the discharge to prevent flood risk elsewhere being exacerbated by the new development, consultation with the Environment Agency and Internal Drainage Boards (IDBs) will be required to determine acceptable runoff rates.

Discussions with IDBs carried out for this Key Constraints Assessment indicated that the IDBs would wish to see runoff rates attenuated to greenfield runoff rate; charges will be levied pro-rata for flow rates above this to account for pump maintenance etc. For a specific large new development, which may require an upgrade to IDB infrastructure, an agreement should be reached with the developer as to the provision and funding of new infrastructure.

2 Constraints Matrices

The outcome of the key constraints assessment was the formulation of a constraints matrix for each of the identified areas. The matrix has been designed so that the amount of subjective interpretation of the data is minimised, and hence the traffic lights allocated are based on factual and quantitative data where possible.

The matrix is intended to provide a visual comparison of the appropriateness of development within each of the areas, with respect to the 5 criteria assessed. For each of the areas a traffic light is applied, and the total number of “green” traffic lights can be directly compared to the total number of “red” traffic lights. Areas with a majority of “green” boxes would be preferred, especially when these are located in the early phasing of the development. It is important to note that the matrix is a broad brush summary, and that a detailed assessment would be used to provide further analysis during the detailed study. See Table 2 below for an example constraints matrix.

Table 2: Generalised Constraint Traffic Lights

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management & SuDS Potential	Surface Water Management
<p>There is an existing raw water source with spare licence capacity, and/or</p> <p>There is water available based on CAMS Methodology Classification.</p>	<p>The development can be accommodated within existing available headroom at WwTW and in wastewater network.</p> <p>Existing River Quality classification is High/Good under Water Framework Directive.</p>	<p>No environmental constraints were identified or development levels are considered sufficiently small that they are unlikely to materially increase impacts on European sites.</p>	<p>There is little or no perceived risk of flooding to the development area.</p>	<p>The site is Groundwater Source Protection Zone 3 (therefore more suitable for infiltration SuDS) or has permeable underlying geology</p>
<p>There is an existing raw water source but with no spare capacity and/or</p> <p>There is no water available based on CAMS Methodology Classification.</p>	<p>WwTW has capacity to accommodate the proposed development but the wastewater network is unlikely to have the capacity and therefore may need upgrading.</p> <p>Preliminary assessment suggests that minor upgrade of existing WwTW will suffice to accommodate housing option.</p> <p>Existing River Quality classification is Moderate under Water Framework Directive.</p>	<p>Medium risk of significant adverse effects as a result of development.</p> <p>Site is downstream of or in close proximity to European sites and may impact upon site if not mitigated.</p>	<p>There is a perceived medium risk of flooding to the development area.</p>	<p>The site is in Groundwater Source Protection Zone 1 or 2 and/or has variably permeable underlying geology</p>
<p>There is no existing raw water source nearby and/or;</p> <p>Water sources are over abstracted/over licensed based on CAMS Methodology Classification.</p>	<p>Major/significant upgrade of WwTW and/or wastewater network is required to accommodate the proposed development.</p> <p>Pumping of wastewater is required to transfer it to a WwTW with spare capacity.</p> <p>Existing River Quality is Poor/Bad under Water Framework Directive.</p>	<p>High risk of significant adverse effects as a result of development.</p> <p>Site is downstream of or in close proximity to European sites and is likely to impact upon site if not mitigated.</p>	<p>There is a perceived high risk of flooding to the development area.</p>	<p>SuDS availability should not be considered to be an absolute constraint to growth.</p>

2.1 South Holland District

Spalding

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.	Spalding WwTW has headroom for approximately 30,019 households in its current DWF consent. The sanitary determinand limits on the consent are very relaxed (120 mg/l BOD & 60A mg/l TSS) and there should be the possibility of treating to a tighter standard if required.	Spalding lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from Spalding WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact. Effects on the adjacent (although upstream) Cowbit Wash SSSI should also be considered.	Spalding lies entirely within Flood Zone 3, although the SFRA mapped actual risk from flooding, which showed that the area to the west of the town is defended to the 1 in 100 year standard. Development within the town will be affected by the outcomes of the Coastal Strategy.	The site is underlain by clay and it is likely that infiltration SuDS will therefore not be suitable. New development will need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates

Holbeach

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.	Holbeach WwTW has headroom for approximately 3,286 households in its current DWF consent. The sanitary determinand limits on the consent are relaxed (60 mg/l BOD & 40A mg/l TSS) and there should be the possibility of treating to a tighter standard if required.	Holbeach lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from Holbeach WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.	Holbeach lies entirely within Flood Zone 3, although the SFRA mapped actual risk from flooding, which showed that the town is defended to the 1 in 100 year standard. Development within the town will be affected by the outcomes of the Coastal Strategy.	The site is underlain by clay and it is likely that infiltration SuDS will therefore not be suitable. New development will need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates.

Long Sutton

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.	Long Sutton lies within the catchment of Sutton Bridge WwTW, which has headroom for approximately 7,265 households in its current DWF consent. The sanitary determinand limits on the consent are very relaxed (230 mg/l BOD & 230A mg/l TSS) and there should be the possibility of treating to a tighter standard if required.	Long Sutton lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from Sutton Bridge WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.	Long Sutton lies entirely within Flood Zone 3, although the SFRA mapped actual risk from flooding, which showed that the town is defended to the 1 in 100 year standard. Development within the town will be affected by the outcomes of the Coastal Strategy.	The site is underlain by clay and it is likely that infiltration SuDS will therefore not be suitable. New development will need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates.

Sutton Bridge

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.	Sutton Bridge WwTW has headroom for approximately 7,265 households in its current DWF consent. The sanitary determinand limits on the consent are very relaxed (230 mg/l BOD & 230A mg/l TSS) and there should be the possibility of treating to a tighter standard if required.	Long Sutton lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from Sutton Bridge WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.	Sutton Bridge lies entirely within Flood Zone 3, although the SFRA mapped actual risk from flooding, which showed that the town is defended to the 1 in 100 year standard. Development within the town will be affected by the outcomes of the Coastal Strategy.	The site is underlain by clay and it is likely that infiltration SuDS will therefore not be suitable. New development will need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates.

Donington

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.	Donington WwTW has a new proposed DWF consent; this variation relates to the current flow at the works (and seasonal variations) and does not consider growth. The works can therefore be considered to be operating at their consented DWF limit and further variations will be required to treat additional flows.	Long Sutton lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from Sutton Bridge WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.	Sutton Bridge lies entirely within Flood Zone 3, although the SFRA mapped actual risk from flooding, which showed that the town is defended to the 1 in 100 year standard. Development within the town will be affected by the outcomes of the Coastal Strategy.	The site is underlain by clay and it is likely that infiltration SuDS will therefore not be suitable. New development will need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates.

Crowland

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.	Crowland WwTW has headroom for approximately 350 households in its current DWF consent and it is therefore likely that an increase in the consented DWF will be required to accommodate the proposed growth. The sanitary determinand limits on the consent are relaxed (40 mg/l BOD & 60 mg/l TSS) and there should be the possibility of treating to a tighter standard if required.	Crowland lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from Sutton Bridge WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.	Crowland lies within Flood Zone 1, although the village is surrounded by Flood Zone 3 and development should therefore be steered away from the outskirts of the village. Development within the town will be affected by the outcomes of the Coastal Strategy.	The site is underlain by clay and it is likely that infiltration SuDS will therefore not be suitable. New development will need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates.

Outlying settlements

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
<p>The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period. For the Boston planning zone there is an average deficit forecast of 8.39 Ml/d, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.</p>	<p>Several of the WwTW serving the outlying settlements have new proposed DWF consents; these variations relate to the current flow at the works (and seasonal variations) and do not consider growth. These works can therefore be considered to be operating at their consented DWF limit and further variations will be required to treat additional flows. Further assessment should be carried out once individual growth sites are known.</p>	<p>The district lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.</p>	<p>Large areas of South Holland District lie within Flood Zone 3, although there are areas defended to the 1 in 100 year standard. Development within the district will be affected by the outcomes of the Coastal Strategy.</p>	<p>The suitability for SuDS is variable and will need to be assessed on a site-by-site basis once individual growth sites are known.</p>

2.2 South Kesteven District

Grantham has been the subject of a separate WCS, but will still be included within the assessment as some of the surrounding areas form part of the Grantham catchment. In addition, although the growth currently proposed for Bourne is already committed, an assessment has been carried out for Bourne, to indicate the future potential for growth over and above those developments already planned.

Stamford

Water Resources	Wastewater Treatment and Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
<p>The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.</p>	<p>Stamford lies within the catchment of Great Casterton WwTW, for which a variation to the consented DWF is proposed; this variation relates to the current flow at the works (and seasonal variations) and does not consider growth. The works can therefore be considered to be operating at its consented DWF limit and further variations will be required to treat additional flows. Further assessment should be carried out once individual growth sites are known.</p>	<p>There are thin areas of Flood Zones 2 and 3 associated with the channel of the River Welland, although the majority of the town lies within Zone 1. Flood risk should therefore not be a major constraint to development.</p>	<p>Stamford is underlain by limestone and it is likely that infiltration SuDS will therefore be suitable, subject to individual site conditions. However, there are large areas of groundwater Source Protection Zones in the town and consultation with the Environment Agency will be required to ensure soakaways do not cause pollution of groundwater.</p>

Bourne

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
<p>The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 MI/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.</p>	<p>An increase to the current consented DWF has been applied for at Bourne WwTW. This relates to the both current flow at the works (and seasonal variations) and the proposed growth, which is already committed and therefore included within AWS's AMP5 plan. The works can therefore accommodate the proposed committed growth but further variations to DWF will be required to treat additional flows. Further assessment should be carried out once individual growth sites are known.</p>	<p>Bourne lies upstream of the Wash & North Norfolk Coast Natura 2000 site and Cowbit Wash SSSI. Any increases in flow from Bourne WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.</p>	<p>Bourne lies within Flood Zone 1, although there are areas of Flood Zones 2 and 3 from tidal flooding to the east of the town. However flood risk should therefore not be a major constraint to development.</p>	<p>Bourne is largely underlain by clay, with small areas of limestone, and it is likely that infiltration SuDS will therefore be largely suitable. New development may need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates. Should infiltration Suds be feasible (following on-site testing), there are large areas of groundwater Source Protection Zones .in the town and consultation with the Environment Agency will be required to ensure soakaways do not cause pollution of groundwater.</p>

Market Deeping

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
<p>The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period, for the Bourne planning zone this is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit.</p>	<p>Market Deeping lies within the catchment of Deeping WwTW, for which a variation to the consented DWF is proposed; this variation relates to the current flow at the works (and seasonal variations) and does not consider growth. The works can therefore be considered to be operating at its consented DWF limit and further variations will be required to treat additional flows. Further assessment should be carried out once individual growth sites are known.</p>	<p>Market Deeping lies upstream of the Wash & North Norfolk coast Natura 2000 site and Cowbit Wash SSSI. Any increases in flow from WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.</p>	<p>The majority of Market Deeping lies within Flood Zone 1, although there are areas of Flood Zones 2 and 3 from tidal flooding to the south and east of the town. However flood risk should therefore not be a major constraint, proving development is directed away from these areas.</p>	<p>Market Deeping is underlain by clay and it is likely that infiltration SuDS will therefore be largely suitable. New development may need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates.</p>

Outlying settlements

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
<p>The Lincolnshire and Fens WRZ is forecast to have a deficit of available water against target headroom from early in the planning period. AWS's WRMP gives a number of proposed schemes to meet the deficit.</p>	<p>Several of the WwTW serving the outlying settlements have new proposed DWF consents; these variations relate to the current flow at the works (and seasonal variations) and do not consider growth. These works can therefore be considered to be operating at their consented DWF limit and further variations will be required to treat additional flows. Further assessment should be carried out once individual growth sites are known.</p>	<p>The district lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact.</p>	<p>There are areas of Flood Zone 3 in South Kesteven District, associated with river channels and development should therefore be steered away from these areas. However, there are large extents of Flood Zone 1 available for development and Flood Risk should therefore not be considered to be a constraint to growth, subject to site specific flood risk assessments.</p>	<p>The suitability for SuDS is variable and will need to be assessed on a site-by-site basis once individual growth sites are known.</p>

2.3 Rutland County

Oakham

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
Oakham is within the East Midlands WRZ, supplied by Severn Trent Water. It is expected to experience a supply shortfall after 2011/12. The shortfall is predicted at 75 MI/d by 2019/20 increasing to 110 MI/d by 2034/35. STW's WRMP gives a number of proposed methods to meet the deficit.	Oakham WwTW has headroom for approximately 6,379 households in its current DWF consent. The sanitary determinand limits on the consent are relaxed (40A mg/l BOD & 60 mg/l TSS) and there should be the possibility of treating to a tighter standard if required.	Oakham lies upstream of the Wash & North Norfolk Coast Natura 2000 site and is in close proximity to Rutland Water SAC, Ramsar and SSSI. Any increases in flow from Oakham WwTW have the potential to impact upon these sites and further assessment and mitigation may be required to prevent an adverse impact. Impacts on Rutland Water from increased water supply will need to be assessed further.	The town lies within Flood Zone 1 and therefore Flood risk is not perceived to constrain development.	The site is underlain by clay and it is likely that infiltration SuDS will therefore not be suitable. New development will need to be connected to the closest surface watercourse and confirmation should be sought from the local IDB or EA as to the available capacity are preferred runoff rates.

Uppingham

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
Uppingham is within the East Midlands WRZ, supplied by Severn Trent Water. It is expected to experience a supply shortfall after 2011/12. The shortfall is predicted at 75 MI/d by 2019/20 increasing to 110 MI/d by 2034/35. STW's WRMP gives a number of proposed methods to meet the deficit.	Uppingham WwTW has headroom for approximately 928 households in its current DWF consent. The sanitary determinand limits on the consent are relaxed (20A mg/l BOD & 40A mg/l TSS) and there should be the possibility of treating to a tighter standard if required.	Uppingham lies upstream of the Wash & North Norfolk Coast Natura 2000 site. Any increases in flow from Uppingham WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact. Impacts on Rutland Water from increased water supply will need to be assessed further.	The town lies within Flood Zone 1 and therefore Flood risk is not perceived to constrain development.	Uppingham is mostly underlain by sandstone and it is likely that infiltration SuDS will therefore be suitable, subject to individual site conditions. It does not overlay any Groundwater source protection zones.

Outlying settlements

Water Resources	Wastewater Treatment and Transmission	Ecology	Flood Risk Management	Surface Water Management & SuDS Potential
<p>The eastern part of Rutland lies within Anglian Water's Lincolnshire and Fens WRZ, which is forecast to have a deficit of available water against target headroom from early in the planning period. For the Bourne planning zone the average forecast deficit in 2036-37 is 6.83 Ml/d. AWS's WRMP gives a number of proposed schemes to meet the deficit. The west of Rutland lies within the East Midlands WRZ and is supplied by Severn Trent Water. It is expected to experience a supply shortfall after 2011/12. The shortfall is predicted at 75 Ml/d by 2019/20 increasing to 110 Ml/d by 2034/35. STW's WRMP gives some proposed methods to meet the deficit.</p>	<p>Several of the WwTW serving the outlying settlements have new proposed DWF consents; these variations relate to the current flow at the works (and seasonal variations) and do not consider growth. These works can therefore be considered to be operating at their consented DWF limit and further variations will be required to treat additional flows. Further assessment should be carried out once individual growth sites are known.</p>	<p>The district lies upstream of the Wash & North Norfolk coast Natura 2000 site. Any increases in flow from WwTW have the potential to impact upon the site and further assessment and mitigation may be required to prevent an adverse impact. Impacts on Rutland Water from increased water supply will need to be assessed further, as will impacts on the other SSSI within the county.</p>	<p>The land adjacent to the River Welland, and localised areas adjacent to Langham Brook (Ashwell) and Whissendine Brook (Whissendine) lie within Flood Zone 2 and 3. The rest of Rutland lies within Flood Zone 1.</p>	<p>The suitability for SuDS is variable and will need to be assessed on a site-by-site basis once individual growth sites are known. The east of the Rutland district is total catchment or outer zone Groundwater source protection zone.</p>

3 Scope of Outline Study

3.1 Planning

- Agreement on housing scenarios and employment areas to be reached.

3.2 Water Resources

- Assessment of the impacts of proposed housing and employment growth on water resource availability and supply network
- Production of water use scenarios, with demand and water savings resulting from the proposed scenarios
- Recommendations for water efficiency measures to be installed in new and existing properties

3.3 Wastewater Treatment and Transmission

- Assessment of the impacts of proposed housing and employment growth on capacity at WwTW
- Assessment of the capacity of the receiving environment to receive additional discharges from WwTW and any water quality impacts that may result from increased discharges
- Determine required consents to allow discharge of increased wastewater volumes, with proposed sanitary determinand limits to ensure no deterioration in downstream water quality
- Assessment of the impacts of proposed housing and employment growth on sewerage network
- Outline options and costs for the provision of any required infrastructure

3.4 Ecology

- Assessment the impacts on designated conservation sites of increased wastewater flows or abstractions required to serve proposed new growth, including an assessment of the impacts of increased water demand on Rutland Water.

3.5 Flood risk

- Assessment of flood risk to key development sites, including the current standard of protection of defences, with reference to existing studies (SFRAs and Coastal Study).

3.6 Surface water management and SuDS potential

- Outline suggestions for suitable SuDS for key development locations and recommendations for adoption and maintenance

- Further discussion with IDBs as to requirements for attenuation of surface run-off and any new infrastructure required for large new developments.

3.7 Recommendations for Detailed Water Cycle Study

- Provide recommendations for Detailed Water Cycle Study, where required

4 Figures

Figure 1 – Study Area

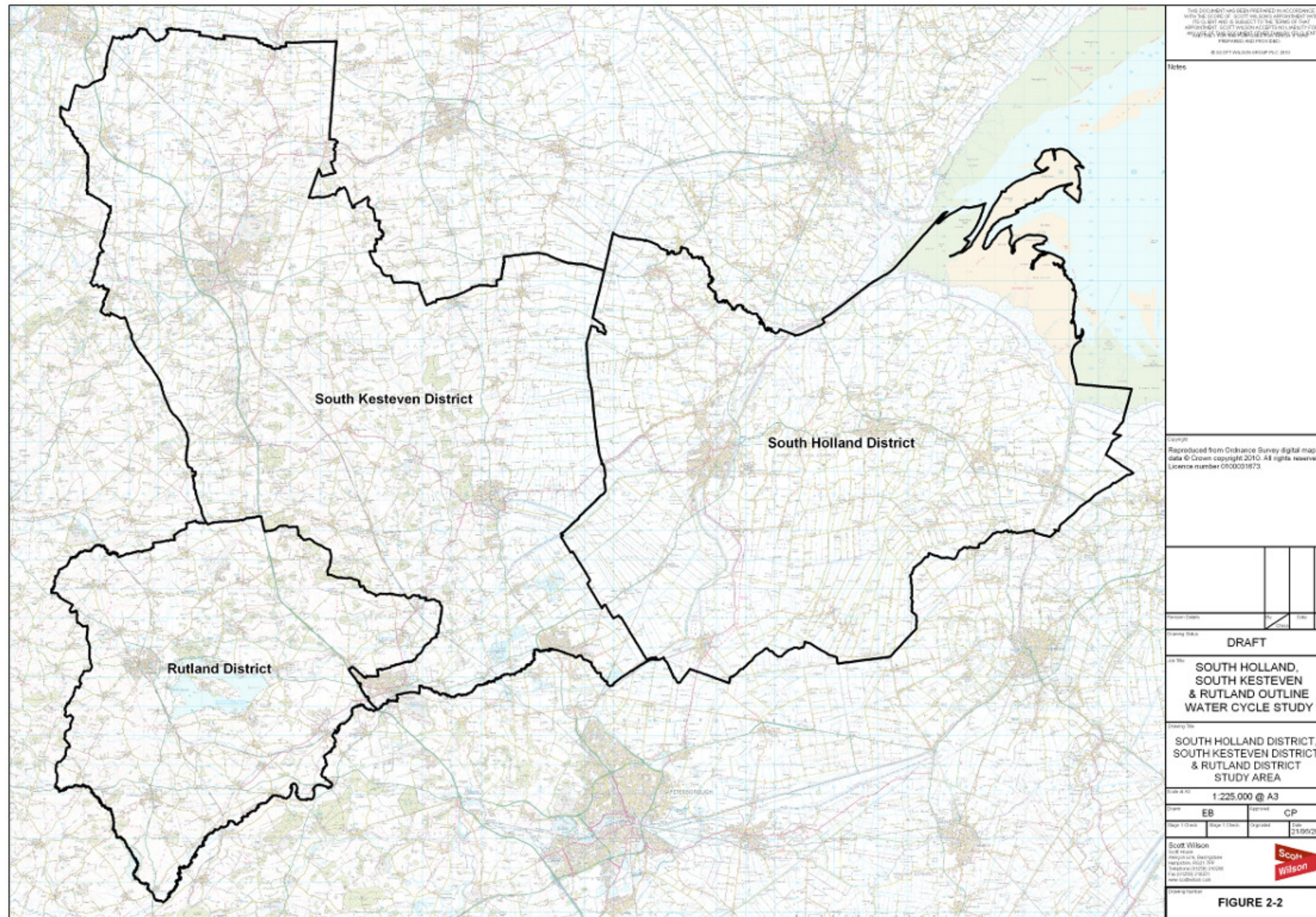


Figure 2 – Wastewater treatment works capacity

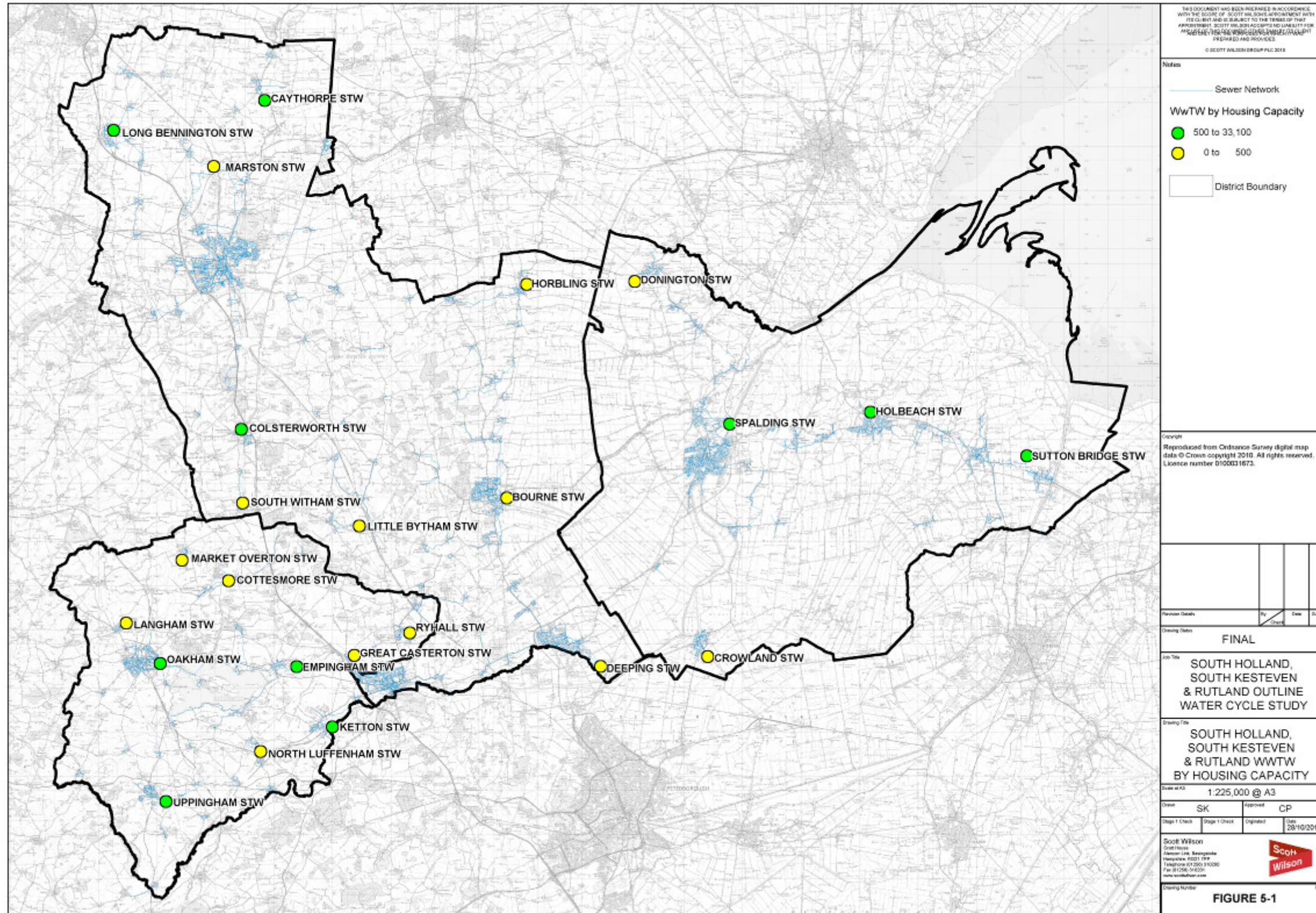


Figure 3 – Designated conservation sites

