MEMO

ARCADIS Design & Consultancy for natural and built assets

SUBJECT
Stage 3 Forest Heath WCS Update - December 2016 Addendum

DATE
05 December 2016

DEPARTMENT
Utilities

TO
Forest Heath District Council

OUR REF
5006-UA008525-UU41R

PROJECT NUMBER
UA008525

AUTHOR
Tom de la Rosa
T +44 (0) 1483 803 004 E tom.delarosa@arcadis.com

1. Executive Summary

Following the Secretary of State's September 2016 decision to refuse planning permission for development at the site known as Hatchfield Farm in Newmarket, Forest Heath District Council has undertaken a re-allocation exercise for the preferred development sites detailed as part of its Local Plan Update.

Arcadis completed a Stage 3 Water Cycle Study (WCS) Update Report which assessed the impact of Forest Heath's draft Local Plan development trajectory on the water environment (Arcadis, November 2016). This WCS addendum provides a review of the conclusions provided as part of that study against the final local plan development trajectory. It is important to note that this addendum should be reviewed in association with the 2016 Stage 3 Water Cycle Study Update.

The finalised development trajectory made several changes, driven by the outcome of the 2016 Hatchfield Inquiry (HFI) which quashed planning proposals for some 400 houses. In general, as a result of these changes development numbers have increased at Red Lodge with minor increases at Mildenhall and West Row. A summary comparison table of the two trajectories is provided below with the difference in dwellings provided in brackets.

Table 1: Site Allocation Local Plan (SALP) New Dwelling Allocation Changes Summary

Settlement	Stage 3 WCS Update draft trajectory (November 2016)	WCS Addendum finalised trajectory (December 2016)
Brandon	68	71 (+3)
Mildenhall	1359	1412 (+53)
Newmarket	654	321 (-333)
Lakenheath	828	828
Red Lodge	836	1129 (+293)
Beck Row	372	0 (-372)
Exning	140	205 (+65)
Kentford	94	97 (-3)

Settlement	Stage 3 WCS Update draft trajectory (November 2016)	WCS Addendum finalised trajectory (December 2016)
West Row	140	152 (+12)
Other / Windfall	220	225 (+5)
Total	**4,771**	**4,440 (-331)**

The overall decrease in the number of dwellings is explained by the planning permissions which have been granted between September and November, this includes a site at Beck Row for circa 350 dwellings.

The addendum comments for each element assessed as part of the Stage 3 WCS Update are summarised in the table below.

Table 2: WCS Addendum Outcome Summary

Assessed Topic	Summary Comments
Water Resources and Supply	The final trajectory makes no increase to the overall potable demand figure assessed as part of the Stage 3 WCS Update of 5,680, the conclusions reached as part of the Stage 3 WCS Update are still valid. **Water supply should not be considered a constraint to the final SALP trajectory.**
Wastewater Treatment and Sewerage	The final trajectory increases housing allocations at Brandon, Mildenhall, West Row and Red Lodge. For Brandon, Mildenhall and West Row the impact of receiving Water Recycling Centres (WRCs) is negligible given the projections showing that Dry Weather Flow (DWF) will still be substantially under the consented flow limits over the study period. Red Lodge, draining to Tuddenham WRC was shown to be exceeding its consented flows by 2031. The environment capacity assessment concluded that the increased discharge due to the trajectory would not lead to a deterioration of WFD status or comprise the achievement of WFD good status. **Wastewater treatment and sewerage should be considered a constraint which can be mitigated through early engagement of developers with Anglian Water and considered approach to development planning.**
Environmental Capacity	The Stage 3 WCS Update identified Natura 2000 sites which could be possible receptors for the draft growth trajectory: Breckland SPA/SAC and Chippenham Fen Ramsar/SAC. The Stage 3 WCS Update concluded that there were no impacts regarding water supply, flood risk and water quality at either of the site. Given the reduction in the development trajectory at Newmarket and the location of Red Lodge in proximity to Natura 2000 sites the conclusions made within the Stage 3 WCS Update are still applicable. In addition, the increased flows from Tuddenham WRC were assessed as part of the Stage 3 WCS Update assessment, which showed that the flows increase a minimal 70 m^3/day from the new trajectory causing minor impacts on the Tuddenham Stream and

Assessed Topic	Summary Comments
	River Lark. Therefore the conclusions reached for this section are also still valid. **Environmental capacity should not be considered a constraint to the final SALP trajectory.**
WRC Discharge Flood Risk	An assessment of the impact on WRC discharges on the existing watercourses was carried out as part of the Stage 3 WCS Update, these calculations were updated to reflect the final trajectory considered in this WCS Addendum. The results showed that there was only minor increases to existing flood risk with no increase in risk bandings for all WRCs. **Flood risk should not be considered a constraint to the final SALP trajectory.**

The assessments carried out as part of this addendum can conclude that the conclusions provided as part of the Stage 3 WCS are still valid and that the finalised trajectory does not have any major constraints which cannot be mitigated through considered approach to development planning and stakeholder engagement.

2. Introduction

Arcadis has been commissioned by Forest Heath District Council (FHDC) to produce an addendum to the Stage 3 WCS which assesses the impacts of the finalised trajectory on the water environment. Arcadis produced a Stage 3 update which assessed the draft Single Allocation Local Plan (SALP) trajectory which allocated dwellings to several settlements across the district. The report concluded that there were no unmitigable constraints for the draft trajectory regarding water supply, wastewater treatment and sewerage, environmental capacity, and flood risk.

In August 2016, the secretary of state quashed the planning inspector's decision to grant planning permission to a site at Hatchfield Farm in New Market for 400 dwellings. In response to this decision, FHDC made amendments to their draft SALP development trajectory which re-allocated sites from Newmarket to other settlements within the district including Red Lodge and Mildenhall.

This WCS addendum contains high level assessments and calculations which should be viewed in conjunction with the Stage 3 WCS Update which cover the four key areas of the water cycle: water supply, wastewater treatment and sewerage, environmental capacity, and flood risk.

3. Updated SALP Development Trajectory

The updated SALP development trajectory was provided by Forest Heath and is detailed in Policy CS7 of the Core Strategy for the Local Plan. It illustrates how FHDC will meet the objectively assessed need of 6,800 dwellings within the district for the period 2011-2031.

The broad distribution for new allocations that have a total 4,215 dwellings is provided below for the key settlements and primary villages.

Table 3: Forest Heath policy CS7: Broad Distribution

Settlement	Policy Site	Size (hectares)	Capacity	Settlement	Policy Site	Size (hectares)	Capacity
Brandon	SA2(a)	0.67	23	Lakenheath	SA7(b)	5.35	140
	SA2(b)	0.3	10		SA8(a)	3.45	81
	Fengate Drove	1.5	38		SA8(b)	22.4	375
Mildenhall	SA4(a)	97	1300		SA8(c)	2.78	67
	SA5(a)	0.78	23		SA8(d)	9.16	165
	SA5(b)	2.1	89	Red Lodge	SA9(a)	9.07	132
Newmarket	SA6(a)	2.9	87		SA9(b)	5.5	140
	SA6(b)	3.57	N/A		SA9(c)	14.97	382
	SA6(c)	4.25	117		SA9(d)	4.15	125
	SA6(d)	4.5	50		SA10(a)	27.4	350
	SA6(e)	0.23	21	Exning	SA12(a)	15	205
	SA6(f)	0.38	46	Kentford	SA13(a)	2.3	34
					SA13(b)	2.2	63
				West Row	SA14(a)	7.8	152

As previously in Table 1, the above represents a change from the draft trajectory in that the number of dwellings allocated to Newmarket and Beck Row has decreased substantially with minor reductions at Exning and Kentford. The reduction at Beck Row is due to a large site for circa 350 dwellings being recently granted planning permission, these dwellings are considered as part of the existing commitments discussed below.

The deficit caused by the reduction is balanced by increases to the number of dwellings allocated to Red Lodge, Mildenhall and West Row with the biggest increase at Red Lodge with an increase of 293 dwellings.

For existing commitments, the Stage 3 WCS Update report utilised data which was correct as of January 2016, however Forest Heath District Council has since made data available from March 2016, these figures have been used in this addendum. During this period, several commitments have been completed and a few new planning applications have been granted. The existing commitment dwelling figures used for this addendum are given in the following table.

Table 4: Forest Heath existing commitments as of 31/03/2016

Settlement	Existing commitments 31/03/16	Settlement	Existing commitments 31/03/16
Brandon	15	Beck Row	380
Mildenhall	123	Exning	127
Newmarket	98	Kentford	107
Lakenheath	38	West Row	47
Red Lodge	104	Other*	87

*Not assessed as part of this addendum.

As with standard practice for WCS, sites which have been completed and windfall sites have not been assessed.

4. Water Resources and Supply

The Stage 3 WCS Update provided an assessment for a total of 5,680 new dwellings over the period 2016-2031, following a review of Anglian Water's 2015 Water Resource Management Plan (WRMP) and subsequent consultation with Anglian Water it was identified that these numbers were below the growth predictions used for the WRMP. This meant that through the measures identified within the WRMP including water transfers and water efficiency, Anglian Water could meet the projected extra water demand.

The total figure assessed as part of this addendum for water supply is 5,566 (existing commitments plus trajectory) dwellings. As this figure is lower than previously assessed the conclusions are still valid, that the water supply should not be considered a constraint for the finalised development trajectory.

5. Wastewater Treatment and Sewerage

As part of the Stage 3 WCS Update undertook assessments across the five Water Recycling Centres across the district which were impacted by the draft trajectory. This assessment identified that only Tuddenham WRC would be exceeding existing volumetric discharge consents by 2031. For the remaining four WRCs there were no major constraints identified in view of the development trajectory, these conclusions were consulted on with Anglian Water.

The finalised development trajectory makes no changes to the settlements where dwellings are allocated, however it does alter the numbers allocated to these settlements. This addendum has therefore assessed the same five WRCs as the Stage 3 WCS Update.

As identified within Section 1 and Section 3, there are increases to numbers at Brandon, Mildenhall, Red Lodge and West Row with Red Lodge having the largest increase of 293 dwellings. A high-level assessment has been undertaken for this addendum to calculate the Dry Weather Flow (DWF) for each WRC by 2031. These calculations have been undertaken using the same methodology as the Stage 3 WCS Update:

$$Total\ DWF = Existing\ DWF + New\ DWF$$

Where

$$DWF = (number\ of\ dwellings. occupancy\ rate. PCC) + infiltration + trade\ flow$$

As before, the per capita consumption (PCC) rate used is 131 l/p/d, infiltration is taken as 25% and trade effluent remains a constant. The existing DWF has been taken from Anglian Water's measured June Return 2015 values. For the assessment trajectory numbers, have been combined with existing commitments numbers as identified in Section 3 to give the total dwelling increase by 2031.

The results of this analysis have been provided below in Table 5 against the values calculated as part of the Stage 3 WCS Update.

Table 5: Final trajectory wastewater treatment summary

WRC	Existing Consent (m^3/day)	Stage 3 WCS Update Draft 2031 DWF (m^3/day)	WCS Addendum final 2031 DWF (m^3/day)	Net Change (m^3/day)
Brandon	2,006	1,214	1,214	0
Lakenheath	860	781	769	-12
Mildenhall	3,900	2,849	2,846	-3
Newmarket	6,100	5,577	5,447	-130
Tuddenham	1,100	1,138	1,208	+70

Key: Green = Below consent +10% buffer | Yellow = Below consent | Red = Above consent

The results show that generally there is an overall reduction in the 2031 DWF values from the Stage 3 WCS Update values apart from Tuddenham which sees a small increase. It can therefore be concluded that for the WRCs aside from Tuddenham that the conclusions as per the Stage 3 WCS Update are still valid.

The impact of exceeding consent values for Tuddenham WRC is considered in Section 5.1 and Section 6 below.

5.1 Tuddenham WRC

The results of the above analysis show the 2031 trajectory DWF value to increase from the Stage 3 WCS Update value which already exceeded the existing consent. As part of the Stage 3 WCS Update the Environment Agency assessed the impacted of increasing consented DWF values on the existing Tuddenham Stream WFD status and the target WFD goals. This assessment concluded that the increased DWF to Tuddenham Stream would have no impact for either of these areas. This assessment has been updated by the Environment Agency to reflect the finalised DWF flows considered in this WCS Addendum and is covered in Section 6.

This assessment concludes that the final trajectory will not lead to a detriment of current WFD status or impede the WFD target status for Tuddenham Stream.

5.2 Sewerage Network

As part of the Stage 3 WCS Update Anglian Water were consulted regarding the capacity of the existing sewerage network, at each of the settlements. The general conclusions for each site where that whilst there are existing capacity issue in some areas, notably Red Lodge. Anglian Water confirmed that with early engagement by site promoters ahead of planning applications that any capacity issues can be mitigated through relevant sewer upgrades ahead of site occupation. It is recommended that FHDC consult Anglian Water prior to granting planning permissions and include suitable planning conditions for the development sites in Red Lodge and other locations as per Stage 3 WCS Update Red Amber Green (RAG) tables provided to ensure such sewer upgrades are implemented with the agreed developer contributions.

The final trajectory does add new sites in certain settlements however given Anglian Water's existing advice on sewerage capacity it can be concluded that it is not considered a constraint to the final development trajectory.

6. Environmental Capacity

The Stage 3 WCS Update assessed both the impact of the draft development trajectory on watercourses (where wastewater discharges were forecast to be increased above the existing consented levels) and also Natura 2000 sites in terms of water supply, water quality and flood risk. These are discussed separately in the following sections.

6.1 Wastewater Discharge Impact

The original assessment undertook an assessment to understand the impact of the increased flows from Tuddenham WRC calculated as part of the wastewater assessment on the Water Framework Directive (WFD) status and targets. This assessment concluded that the increased discharge to Tuddenham Stream would not compromise the existing WFD status or impede the achievement of 'Good' status by 2027.

As identified in Section 5, flows from Tuddenham WRC have increased by approximately 70m^3/day. The Environment Agency have been consulted and have updated their previous assessments and provided the following conclusions:

No Deterioration Assessment:

AMP6 No Deterioration schemes for ammonia and phosphate should be sufficient to maintain the current High and Poor classifications for all three assessed DWF figures, which include flows from the final development trajectory. The ammonia limit should be tightened to 0.6 mg/l, but current and predicted future over-performance is likely to deliver the required effluent quality.

A BOD limit of 8 mg/l is required (for all 3 DWFs) in order to ensure current Good status in the Tuddenham Stream is maintained. Again, current effluent quality and predicted continued over-performance means that the permit change will not be required unless actual river quality deteriorates.

Improve WFD status assessment:

Permit limits of 0.3 mg/l and 0.12 mg/l are required to improve river phosphate status to Moderate and/or Good status respectively. Both are currently considered to be below the limit of 'technical feasibility' (pending outcome of AMP6 '0.1 mg/l P Trial').

WCS Addendum Conclusion

No proposed permit changes to account for growth. Permit limits planned for AMP6 will ensure no deterioration in the Tuddenham Stream. Delivery of either growth Option will not compromise future status improvements.

6.2 Natura 2000 sites

The Stage 3 WCS Update assessed impact for ten Natura 2000 sites within the district, of these two were taken forward for further assessment due to their proximity and relation to the impacted settlements, Chippenham Fen Ramsar and Breckland SAC/SPA. Chippenham Fen is located downstream of Newmarket and Breckland covers a large area to the north east of Forest Heath District. The assessment looked at three elements regarding the sites: flood risk, water quality and water supply which concluded that there would be no impact for any of these elements as illustrated within the supporting WCS sections.

This addendum has taken the same approach and reached for the following conclusions:

- Flood Risk: Section 7 has evidenced that the impacts on river flows from the WRCs within the district are uniformly low. Assuming required upgrades are implemented to the impacted sewer network, there is no impact identified.
- Water Quality: Sections 5.1 and 6.1 have shown that only Tuddenham WRC is expected to increase wastewater discharges above consented levels and that this increase will not lead to a negative impact regarding water quality.

- Water Supply: Section 4 has evidenced, regarding the Stage 3 WCS Update that the final development trajectory can be supplied without increasing existing abstraction licences, thereby it can be concluded that there is no impact.

Considering the above it can therefore be concluded that the final development trajectory does not adversely impact either receiving watercourses for wastewater discharges or negatively impact Natura 2000 sites.

7. Flood Risk

As part of the Stage 3 WCS Update an assessment was carried out to understand the impact of the future WRC DWF flows on the watercourses that received them. Calculations were undertaken which quantified the increase to QMED for receiving watercourses from the flow to full treatment (FTFT), typically three times DWF. The increases to flows were converted to percentages and assigned a risk rating dependant on their values, as detailed in the table below. The Stage 3 WCS Update assessment concluded that the increased DWF flows from the development did not increase risk of flooding to the receiving watercourses.

For this addendum, the calculations were updated to represent the final DWF flows from each of the WRCs. The outputs of these calculations are shown below in Table 6.

As with the Stage 3 WCS Update assessment for Tuddenham calculations have been undertaken for both Tuddenham Stream and the River Lark. Tuddenham stream is a small watercourse not located in proximity to any potential flood risk receptors, with discharges from Tuddenham WRC only briefly flowing through the stream before joining the River Lark. Due to Tuddenham's relative size the assessment in terms of percentage is not reflective of the true flood risk arising from increased discharge. The assessed impact of the River Lark is a more accurate illustration of the potential impacts on flood risk within the district. It is assumed that Anglian Water undertake modelling to confirm the impact of increased discharge as part of their future work.

Table 6: WRC Discharge impact on existing 1 in 2 year flows (QMED)

Settlement	Impact of existing WRC FTFT on baseline river flows (i.e. without extra flows from new development under final option)	Increase in river flows by 2031 based on entire WRC FTFT (**including** existing WRC DWF)	Increase in river flows by 2031 based on entire WRC FTFT (**excluding** existing WRC DWF)
Brandon	0.23%	0.23%	0.00%
Lakenheath	2.90%	4.11%	1.21%
Mildenhall	1.24%	1.61%	0.36%
Newmarket	4.63%	5.01%	0.38%
Tuddenham (Tuddenham Stream)	38.72%	58.77%	20.05%
Tuddenham + Fornham All Saints (River Lark)	0.41%	2.06%	1.65%

Key: Green = 0 to 3% increase (Low Risk) | Yellow = 3 to 20% increase (Medium Risk) | Red = 20%+ increase (High Risk)

The above results show that that as with the Stage 3 WCS Update flood risk is increased marginally with a maximum increase of 1.65% to QMED at the River Lark. It can therefore be concluded that the wastewater discharges from the final trajectory do not increase flood risk unacceptably within the district.

8. Conclusions

- Following a decision to overturn planning permission by the Secretary of State for a development site at Hatchfield Farm, Forest Heath District Council have revised their final SALP development trajectory as part of Core Strategy 7 of the Local Plan.
- Arcadis completed Stage 3 Water Cycle Study Update in November 2016 based upon the draft development trajectory provided by Forest Heath District Council (as of August 2016), and the conclusions of this document have been reviewed against the finalised SALP development trajectory used in this WCS Addendum to ensure that the water cycle and infrastructure needs are sufficiently considered.
- Assessments have been carried out for the finalised development trajectory for: water resources and supply, wastewater treatment and sewerage, environmental capacity, and flood risk.
- In terms of water resources and supply this addendum has confirmed that the finalised development trajectory can be adequately supplied and it is below the previous assessed total figure and the trajectory used to inform Anglian Water's 2015 WRMP.
- The finalised development trajectory has re-allocated sites to existing settlements identified in the Stage 3 WCS Update, and of the five Water Recycling Centres impacted by the development trajectory four will not exceed existing volumetric consents. The fifth, Tuddenham WRC has been identified to exceed its current flow consent limits but the WCS assessment showed that this will not lead to a detriment of WFD status or impede the achievement of 'Good' status by 2027 and therefore is not a major constraint at this stage.
- The WCS Addendum has confirmed that there is no impact to the Stage 3 WCS Update conclusions for the Natura 2000 sites within the district, and therefore the previous conclusions are still valid for the finalised development trajectory.
- Flood risk from increase DWF discharges has been assessed with the conclusions that flood risk is not significantly impacted by the final SALP development trajectory.