
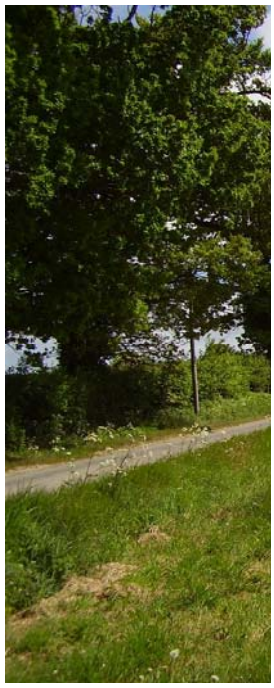


Joint Core Strategy Habitats Regulation Assessment

Water Resource Availability Study
Greater Norwich – Addendum to Habitats Regulations Assessment to Consider Impact of Water Abstraction to 2015

June 2012

Greater Norwich Development Partnership

Mott MacDonald

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Greater Norwich Development Partnership

PO Box 3466
Norwich, NR7 7NX

Mott MacDonald, Demeter House, Station Road, Cambridge CB1 2RS, United Kingdom
T +44(0) 1223 463500 F +44(0) 1223 461007, W www.mottmac.com

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B	15/09/2010	Peter Ede	Mark Johnston	Gerry Kelly	Revisions following discussions with Client
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E	31/01/2012	Roger Burroughs (Broadland District Council) Peter Ede	Jackie Fookes	Mark Frith	Revisions following discussion with Anglian Water, Natural England and the Environment Agency
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G	23/06/2012	Peter Ede	Jackie Fookes	Mark Frith	Final

Mott MacDonald, Demeter House, Station Road, Cambridge CB1 2RS, United Kingdom
T +44(0) 1223 463500 F +44(0) 1223 461007, W www.mottmac.com

Contents

1. Introduction

1.1 Background

Mott MacDonald has been commissioned by the Greater Norwich Development Partnership to undertake additional work to supplement the Habitats Regulation Assessment (HRA) produced for the joint core strategy for Broadland, Norwich and South Norfolk. This additional work assesses the potential effects of the assumptions in the Joint Core Strategy (JCA) for Broadland, Norwich and South Norfolk about development likely to happen within the current Anglian Water Asset Management Plan period. It focuses solely on the availability of potable water to serve this short term need without infringing the Habitats Regulations.

This study is a follow up to previous assessments undertaken by Mott MacDonald (Task 1 and Task 2 Appropriate Assessments) and will address identified uncertainties in available water resources within the Greater Norwich area. The uncertainties addressed in this study are specifically related to abstractions within the River Wensum Special Area of Conservation (SAC), in particular at the Costessey abstraction point.

It is believed that the abstraction of water at Costessey is impacting negatively on the lower reaches of the River Wensum SAC. To address this, the Environment Agency (EA) undertook a Review of Consents (RoC) for all licenses within the Wensum hydrometric catchment with the aim of altering the amount of water abstracted to reduce impacts on the River Wensum SAC. The results of this are summarised in paragraph 2.2.1.

The aim of this study is to establish whether existing licensed sources of water in the Greater Norwich area, with particular emphasis to the Wensum hydrometric catchment and SAC, can be used to meet development requirements in the immediate future up to 2015. In light of the conclusion of the RoC that existing levels of licensed abstraction are considered to be having an adverse effect on the integrity of the River Wensum SAC and that changes in the short term to public water supply arrangements are needed to remove this impact, it is also necessary to consider whether development needs could be met without fully utilising currently licensed abstraction. Long term measures will be assessed by Anglian Water Services (AWS) through future Asset Management Plan periods and are not included in this study. This will involve specific assessment under the Habitats Regulations.

The objectives of this study are to:

- Look at existing licensed abstractions particularly at Costessey and Thorpe St Andrew;
- Assess if fully utilising Thorpe St Andrew licensed abstraction combined with actual current abstraction at Costessey would cater for developmental needs in the short term. This should also be considered in light of the EA RoC;
- Assess if the above would avoid damage to the River Wensum SAC and thus comply with the Habitats Regulations or whether a reduction in existing levels of abstraction at Costessey would be compatible with an adequate level of supply of potable water to meet short term development needs.
- Verify that abstraction currently licensed at Thorpe St Andrew has been subject to an appropriate assessment and been through the RoC; and
- Quantify any resources identified which may be available for development, and relate to an equivalent in terms of dwellings.

The scope for the study is reproduced in Appendix A.

1.2 Sources of Information

Information used in undertaking this assessment was obtained from the following sources:

- Anglian Water Services (AWS) provided information on deployable outputs and forecast demand for the period up to 2015 from their Water Resource Management Plan (WRMP), and records of abstraction at Costessey;
- The Environment Agency provided abstraction licenses, hydrometric data on the River Wensum, location of borehole sampling points, groundwater data, discharge consents, the River Wensum Review of Consents SAC document and the Guidance Note on Growth and Water in Greater Norwich;
- Conclusions of the Environment Agency's RoC and Site Action Plans;
- Habitats Regulation Assessment: Joint Core Strategy for Broadland, Norwich and South Norfolk, Mott MacDonald February 2010;
- Evidence provided by AWS to the Examination in Public into the Joint Core Strategy for Broadland, Norwich and South Norfolk in November, 2010, and subsequent clarifying note (the latter reproduced as Appendix B);
- Statement of common understanding on water resources - Anglian Water, Environment Agency, Natural England dated 3rd November, 2010.

Other information used in the assessment was obtained from the Greater Norwich Development Partnership website (http://www.gndp.org.uk/), including the following:

- Joint Core Strategy for Broadland Norwich and South Norfolk: Proposed Submission Document November 2009; and
- Greater Norwich Development Partnership: Stage 2b Water Cycle Study, Technical Report Final, February 2010.

In addition to discussions with AWS and the EA about data, we contacted AWS to ascertain their position with regard to potential alternative sources of water that might allow abstraction from Costessey to be reduced. We also discussed relevant aspects of the work with Natural England.

2. Assessment

2.1 Water Resources

2.1.1 Costessey Surface Water Abstraction

Details of surface water abstraction from the River Wensum at Costessey (Licence No: 7/34/11/*S/0399) are presented in Table 2.1. The daily peak refers to abstractions from Costessey Pits; the licence for abstraction from the river (for input to the Pits) allows up to 120 Ml/d, but this is only used for short periods if storage in the Pits has dropped.

Table 2.1: Costessey Abstraction Licence Information

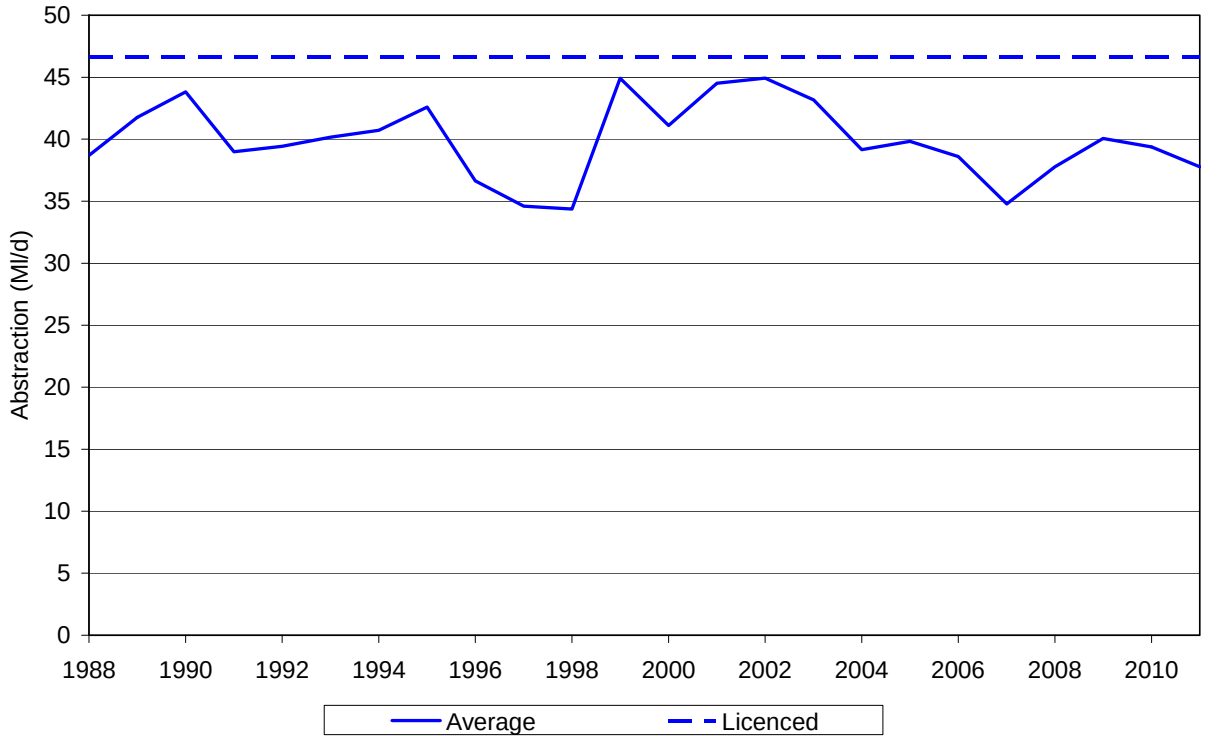
Annual Licence (m^3)	Existing Daily Average Licence (Ml/d)	Existing Daily Peak Licence (Ml/d)	Actual Average Daily (Ml/d)
17 000 000	46.6	57.7	39.5

SOURCE: Environment Agency Abstraction Licence Database and Anglian Water

The total annual quantity of water licensed for surface water abstraction from the Wensum hydrometric catchment represents an average of 50 Ml/d. Comparison with Table 2.1 shows that the existing average daily licensed abstraction at Costessey (46.6 Ml/d) represents approximately 93% of the total quantity licensed for surface water abstraction in the River Wensum catchment; the balance is made up of a number of smaller abstractions. Table 2.1 also shows that the actual abstraction is lower than the licensed daily average, by a margin of about 15% (this is based on data for the period 2002-11). However, this apparent scope for increased abstraction is not significant in practice because AWS report that the peak daily licence provides the constraint at Costessey.

The actual abstraction data (Figure 2.1) shows only minor variation in annual abstraction since the Costessey intake was first used in 1988, with the average ranging from about 34 to 45 Ml/d. The maximum annual abstraction in the last 8 years is about 40 Ml/d.

Figure 2.1: Abstractions from the Wensum at Costessey



Source: Raw data from Anglian Water

2.1.2 Thorpe St Andrew Abstraction

Details of abstraction from boreholes within the Thorpe St Andrew area (Licence No: 7/34/15/*G/0177) are presented in Table 2.2.

Table 2.2: Thorpe St Andrew Abstraction Licence Information

Annual Licence (m^3)	Existing Daily Average Licence (Ml/d)	Existing Daily Peak Licence (Ml/d)	Actual Average Daily (Ml/d)
5 000 000	13.7	22.7	8.4

SOURCE: Environment Agency Abstraction Licence Database and Anglian Water

Table 2.2 shows that the actual average daily abstraction at Thorpe St Andrew is approximately 60% of the average licensed daily amount. Full usage of this headroom would require some additional investment on additional boreholes and pipelines. AWS has planned investment to allow some increased abstraction during future Asset Management Plan (AMP) periods, starting in AMP6 (2015-2020).

The combined average actual abstraction from Costessey and Thorpe St Andrew is about 48 Ml/d. There are a few other abstractions but these are very minor by comparison.

2.2 Relevant Reports

2.2.1 Review of Consents

A Stage 3 Appropriate Assessment (EA, 2010) was undertaken for the River Wensum SAC applying targets derived from Natural England's Favourable Condition Tables and Habitats Directive Ecological River Flow (HDERF). The assessment established that "in combination" abstractions presented a high risk to the integrity of European features in the lower reaches of the River Wensum SAC. As such, the SAC in its lower reaches is currently not in a "favourable condition".

In order to restore the SAC to favourable conditions, a Stage 4 Appropriate Assessment was undertaken (EA, August 2010). This involved an appraisal of potential options identified to remove the risk to features in the designated European site.

These options were as follows (reproduced from the EA report):

- Option 1a: Do nothing, hence affirm all licences assessed at stage 3. Take no further action;
- Option 1b: Do Nothing/Affirm all licences subject to Habitats Regulation 50 Review, but use existing Catchment Abstraction Management Strategy (CAMS) licensing policy to reduce abstraction pressure within 3 km radius from Time Limited ('T/L') (i.e. Habitats Regulation 48) licences only by modifying those licences at renewal i.e. rely on Habitats Regulation 51(3) action by the Environment Agency to remove abstraction impact from SAC;
- Option 2: Revoke licence 7/34/11/*S/0399 (Public Water Supply, PWS abstraction licence at Costessey/Heigham);
- Option 3: Modifying licence 7/34/11/*S/0399 (PWS abstraction licence at Costessey/Heigham) to remove adverse effect either by reducing total licensed quantity or by relocation of the surface water intake outside the SAC boundary;
- Option 4: Reduce abstraction impact by modifying licences in combination effect, only;
- Option 5: Reduce abstraction impact by modifying 7/34/11/*S/0399 (PWS abstraction licence at Costessey/Heigham), plus other licences with in combination effect; and
- Option 6; Use the proposed River Wensum Restoration Strategy to mitigate for abstraction related impact.

Option 5 was chosen as the **preferred option**.

'In the first instance, and before 2015, a reduction equivalent to 20 Ml/d shall be applied to the total annual licensed quantity to remove the risk to the site in its current condition from fully licensed abstraction' (Environment Agency[1]).

The report adds that subsequently there would be further modification to the licence to ensure that required flow standards are met at Hellesdon Mill. The nature of such modification is not detailed, but the required flow standard would be the Habitats Directive Ecological River Flows (HDERF).

Information from the EA RoC suggests that abstractions from Thorpe St Andrew were not included in the list of licenses identified to have an "in combination effect" and scheduled for either revocation or modification. It is therefore concluded that abstractions from Thorpe St Andrew within its licence would not adversely affect the River Wensum SAC. The Thorpe St Andrew source was also reviewed under the RoC for the Broads and Broadland SPA; this RoC identified that changes were required to the Thorpe St Andrew licence. The changes are incorporated in AWS plans and the assessment of the supply/demand balance. The latest AWS position is described in section 2.4.

2.2.2 Statement of common understanding, November, 2010

This statement was jointly agreed by AWS, Natural England and the Environment Agency, and superseded an earlier note published by the Environment Agency[2]. It reflected growing concern that existing licensed levels of abstraction at Costessey were causing an adverse effect on the SAC and set out a joint agreed position to address this.

The proposed reduction in Costessey abstraction of up to 49 Ml/d would be achieved progressively over successive business planning cycles as follows:

1. a 20 Ml/d reduction by 2015;

2. if required, a further reduction of up to 29 Ml/d by 2020 or soon thereafter.

[1] River Wensum SA Site Action Plan Version 5.0 Environment Agency August 2010

[2] Guidance Note on Growth and Water in Greater Norwich, Environment Agency, August 2010

Given the average and licensed levels of abstraction described in section 2.1.1, the eventual average reduction could not be as great as 49 Ml/d because abstractions have never been that high.

AWS agreed to identify its preferred option for the initial reduction by January 2012. It was further agreed that if a solution to deliver a 20Ml/d reduction cannot be found then AWS will deliver as much reduction as possible by 2015.

The agreed outcome in the short term was a reduction in the levels of abstraction at Costessey to historic levels, defined as levels of abstraction in 2005. This capping of abstraction would remain until the full RoC was implemented.

Natural England confirmed as part of the statement that this would satisfy their concerns for the interim period.

2.3 Analysis

2.3.1 Costessey Flows

The EA provided a long term flow duration curve, FDC (1960 to 2010) at Costessey Mill gauging station. However, use of this FDC to assess available water resources would be misleading because the abstraction point is upstream of the gauging station. Furthermore, the abstraction point was moved (from downstream of the gauging station) in 1988, so only part of the data used to derive the FDC is representative of current conditions.

In order to address this point, the recorded daily flows for Costessey from 1988 onwards were adjusted by adding actual daily abstraction (data obtained from AWS) to the recorded flows at Costessey Mill gauging station. This is not a fully-naturalised flow because it does not take account of other artificial influences (abstractions and discharges) further upstream. However, such influences are small compared to the Costessey abstraction.

The recorded data is not quite complete – various periods of missing data amount to about two years out of the overall period of 50 years (1961-2010). For these periods' simulated flows from a previous catchment modelling study for AWS were used (with adjustment for abstraction). This reduces the risk of bias in the results if (for example) the missing periods were unusually dry or mostly occurred at a particular time of the year.

Figure 2.2 shows the FDC of part-naturalised flows, “current” flows (based on average abstraction over the past 10 years) and potential flows if the abstraction licence is reduced as proposed in the RoC (this is the first stage reduction, to 20 Ml/d below the current annual licence).

Flow duration statistics and the percentage reduction in flows as a result of abstraction at Costessey Mill are presented in Table 2.3. HDERF thresholds for SAC and Site of Special Scientific Interest (SSSI) rivers are presented in Table 2.4.

Figure 2.2: Costessey Mill Flow Duration Curves

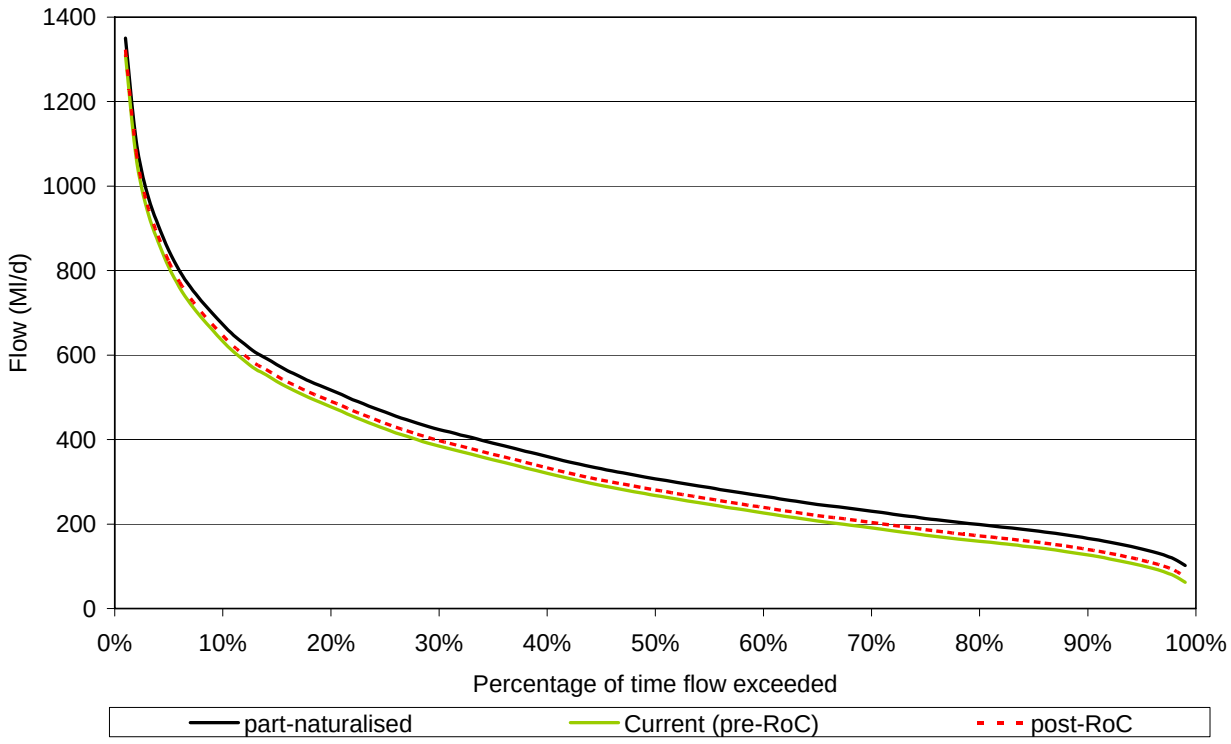


Table 2.3: Costessey Mill Flow Duration Statistics

Percentile	Part-naturalised flow (Ml/d)	Expected flow (Ml/d) pre-RoC	Expected flow post-RoC	% reduction pre-ROC	% reduction post-ROC
1%	1350	1310	1323	3%	2%
2%	1107	1067	1080	4%	2%
5%	848	809	822	5%	3%
10%	672	633	646	6%	4%
20%	517	478	490	8%	5%
30%	424	384	397	9%	6%
40%	360	320	333	11%	7%
50%	307	267	280	13%	9%
60%	266	226	239	15%	10%
70%	230	191	204	17%	12%
80%	199	159	172	20%	13%
90%	166	127	140	24%	16%
95%	141	101	114	28%	19%
98%	117	77	90	34%	23%
99%	102	62	75	39%	26%

Table 2.4: HDERF Thresholds for SAC/SSSI Rivers

Environmental Weighting Band	HD ERF Maximum Percentage Reduction From Daily Naturalised Flow		
Sensitivity	**< Q50**	**Q50 - Q95**	**>Q95**
High	15%	10%	5 - 10%
Moderate	20%	15%	10 -15%

Table 2.3 shows a reduction of 28% in flows at Q95. This is in excess of the allowable HDERF threshold for SAC rivers assigned an environmental weighting band of high or moderate sensitivity (available information suggests the River Wensum SAC ranges from moderate to high sensitivity. The assessment point at Hellesdon Mill is assigned moderate sensitivity).

Applying the EA RoC to abstractions at Costessey leads to a smaller reduction in naturalised flow (19%), but this is still beyond the maximum allowable limit of a moderately sensitive SAC river. This suggests that there would need to be further reductions in allowable abstractions at Costessey Mill in order to meet HDERF targets (as implied by the comments in the RoC referred to in the penultimate paragraph of section 2.2 above). To meet the maximum 15% reduction at Q95 for moderate sensitivity, the average abstraction would need to be reduced

by a further 5 Ml/d. However, it should be stressed that this is based on simplified calculations that do not use a fully-naturalised flow series.

It should be noted that previous EA analysis used estimated flows (from a regional groundwater model) for Hellesdon Mill rather than Costessey, and that the period analysed was 1988-2005. Hellesdon Mill is at the downstream end of the reach of interest; the catchment area is slightly larger (by about 2%), but the EA's work showed that overall there is little change in flow between the two sites. The Wensum SAC quotes naturalised flows for Hellesdon Mill for various points from Q10 to Q99; bearing in mind the different data periods, locations and methods, these agree well with the part-naturalised values in Table 2.3, with differences ranging from -6% to +8%.

2.3.2 Available Water Resource

Fully utilising the Thorpe St Andrew licence (based on Table 2.2) would provide an additional 5.3 Ml/d available for abstraction at this point, subject to the required investment at the source and for transmission.

Anglian Water's forecast average occupancy rate for new-build properties is 2.1 people (though recent information from AWS suggests that this may be revised down to 2.04). Current Building Regulations have a water usage standard of 125 l/h/day, but Levels 4 and 5 of the Code for Sustainable Homes indicate reduced figures of 105 and 80 l/h/day respectively. The potential additional abstraction from Thorpe St Andrew could supply from 20000 to 32000 households (Table 2.5). This does not take account of the fact that a proportion of the members of such households would be from the immediate area and therefore already receiving water, possibly from Thorpe St Andrew. This category would include young people currently living with parents, who would hope to move if/when availability of housing improves. The net increase in demand due to 20000 new houses at 125 l/h/d would therefore be less than 5.3 Ml/d, but it is difficult to quantify this effect.

Table 2.5: Potential Number of Households Supplied from Thorpe Headroom

Per capita consumption (l/h/d)	Households
125	20000
105	24000
80	32000

2.4 Future Water Requirements for Period up to 2015

Availability and demand data for the period up to 2015 for the Norwich and the Broads Water Resource Zone (WRZ) was provided by AWS and is presented in Table 2.6; information was not available for the Norwich/River Wensum area alone. The information was extracted from the AWS Water Resource Management Plan (WRMP) and is based on the least cost forecast. This shows only minor changes in demand over the period, with an overall increase to 2014/15 of just 1.0%. The availability figures are "Water Available for Use" (WAFU) whilst the demand figure is the distribution input which includes allowance for leakage. The figures include allowance for the effect of planned investments over the period.

Table 2.6: Anglian Water Demand Forecast

Year	2010-11	2011-12	2012-13	2013-14	2014-15
Water Available for Use (WAFU)					
	Ml/d	**Ml/d**	**Ml/d**	**Ml/d**	**Ml/d**
Average	78.94	78.83	78.65	78.39	78.09
Peak	109.86	109.71	109.46	109.12	108.71
Demand (Distribution Input)					
	Ml/d	**Ml/d**	**Ml/d**	**Ml/d**	**Ml/d**
Average	65.02	64.94	65.03	65.30	65.64
Peak	83.03	82.92	82.94	83.17	83.50

SOURCE: Anglian Water , Water Resource Management Plan

The submitted JCS housing trajectory[3] up to 2015 is presented in Table 2.7. The water demand figures are based on the same assumptions as those used for Table 2.5 above.

[3] Joint Core Strategy for Broadland Norwich and South Norfolk: Proposed Submission Document November 2009

Table 2.7: Joint Core Strategy Housing Trajectory

Period	Total Planned Completions	Projected Occupancy (Persons)	Total Water Demand (Ml/day)		
	per capita consumption (l/h/d)		*125*	*105*	*80*
2010/11	1593	3345	0.42	0.35	0.27
2011/12	2075	4358	0.54	0.46	0.35
2012/13	2352	4939	0.62	0.52	0.40
2013/14	1899	3988	0.50	0.42	0.32
2014/15	2439	5122	0.64	0.54	0.41
TOTAL	10358	21752	2.72	2.28	1.74
Usage of Thorpe St Andrew headroom			51%	43%	33%

As described above, it is important to note that some of the total demand for new houses may be cancelled out by reductions elsewhere.

The AWS demand figures take account of all relevant projections, including population, per capita demand, non-household demand and leakage, and in particular including the JCS housing trajectory. These show that the overall change over the period to 2015 is insignificant. Therefore Anglian Water is in a position to meet demands over this period without the need for any increase in abstraction at Costessey.

However, the agreement of common understanding dated 3 November, 2010 required an immediate cap in abstractions at Costessey to historic levels and this position was confirmed at the public examination into the joint core strategy. This cap represents a decrease in supply of 6 Ml/d. AWS reaffirmed its commitment to reducing abstraction in a memo dated 17th November 2010 and has further confirmed this in an email dated 18th May 2012. The memo and the email are reproduced in Appendix B.

The draft Norwich Joint Core Strategy (JCS) document sets out an aim to build approximately 22,500 dwellings between 2010 and 2020. Natural England have advised that any proposals coming forward ahead of the implementation of the RoC solution for the River Wensum SAC should not exacerbate the adverse affect on the Wensum by involving increased abstraction from Costessey.

AWS committed to undertake an assessment into the level of growth that could be accommodated by existing sources over AMP5 with the inclusion of the reduced abstraction at Costesssey. The assessment is based on outputs from the AWS Water Resources Management Plan (WRMP) final planning scenario (WRP4) for the Norwich and the

Broads WRZ, February 2010 and is summarised in Table 2.8 below. It includes all relevant sources and not just that at Thorpe St Andrew.

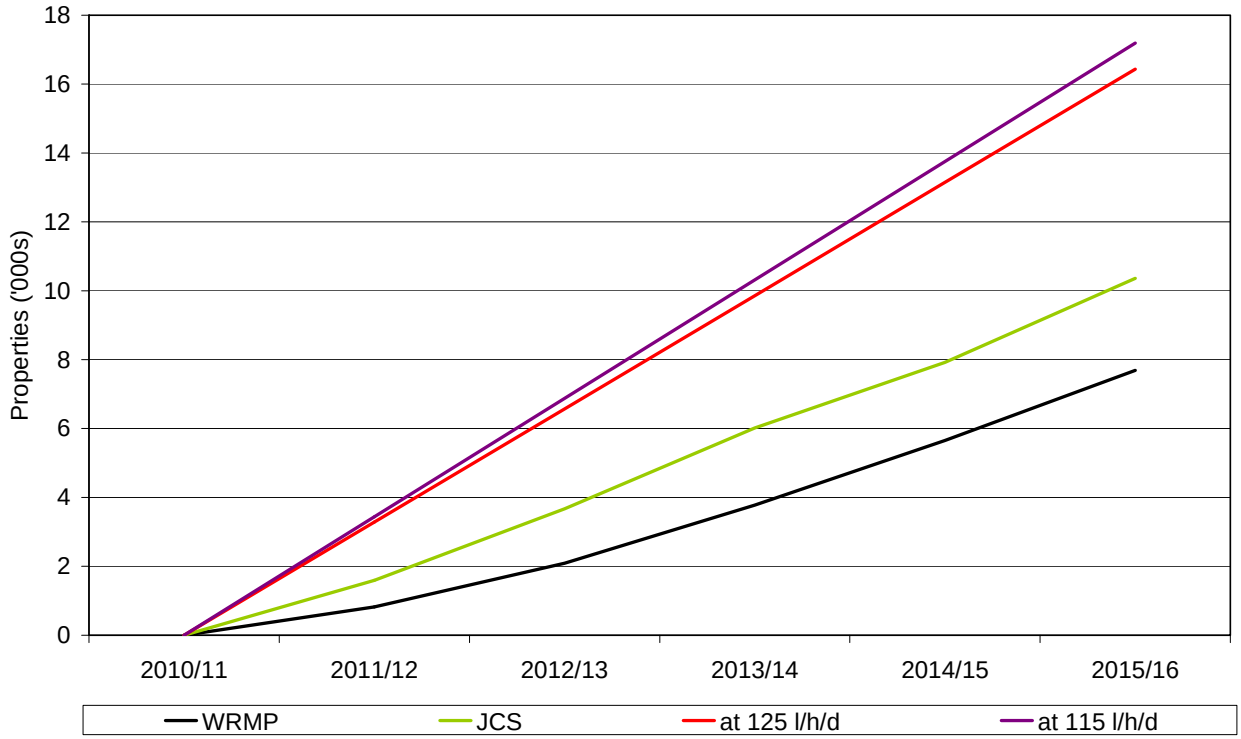
Table 2.8: Norwich & The Broads WRZ Revised Supply/Demand Balance and Build Capacities

Description	Units	2010/11	2011/12	2012/13	2013/14	2014/15
Norwich & The Broads Supply/demand balance (WRMP)	Ml/d	10.21	10.11	9.72	9.02	8.22
Revised S/D balance (cap on abstraction from Costessey)	Ml/d	4.22	4.12	3.73	3.03	2.23
Additional build capacity at 125 l/h/d	'000s					8.74
Additional build capacity at 115 l/h/d	'000s					9.50
Cumulative new properties included in WRMP	'000s	0.82	2.09	3.78	5.65	7.69
Total build capacity at 125 l/h/d	'000s					16.43
Total build capacity at 115 l/h/d	'000s					17.19

With the revised supply demand balance of 2.23 Ml/d, AWS would be able to meet their own previously assumed growth forecast of 7,690 properties and also accommodate an additional 8,740 properties (based on 125l/h/d consumption) or 9,500 properties (based on 115 l/h/d consumption) by 2015. At this level of growth they can maintain service commitments to customers and the supply demand balance remains in surplus.

By annualising the total build capacities that could be supported under the two consumption rates AWS would be able to fully support the property growth forecast in the Joint Core Strategy as shown in Figure 2.3 below.

Figure 2.3: Potentially-supported Properties in Norwich & The Broads



Source: Raw data from AWS

The demand forecast assumes that the population served will increase between 2010 and 2035, having taken into account the current economic downturn and the expected recovery from it. In the WRMP AWS also assumed an overall decline in measured water consumption to 130l/h/d by 2030. These growth forecasts have been scrutinised and accepted by the regulators.

The calculations of potential additional household properties that could be served (i.e. in addition to those included in the WRMP) do not include any consideration of non-household consumption that might be associated with the additional household properties (e.g. additional employment in the area). However, such associated consumption is likely to be small in comparison to household consumption. In the WRMP, AWS forecast that measured non-household consumption in the Norwich and the Broads RZ will decline from 9.6 Ml/d to 7.1 Ml/d over the period between 2007-08 and 2034-35. Unmeasured non-household consumption is forecast to remain steady at 0.61 Ml/d. This

means that non-household consumption is in the region of 10% of total consumption. AWS reports that it currently has no information to suggest that there will be large increases/decreases in non-household demand (Moncaster, 2012).

On the basis of this assessment, the forecast level of growth up to 2015 outlined in the WRMP would be achievable under the revised abstractions from Costessey, and the JCS housing projections could also be supported without increasing the adverse effect on the River Wensum SAC as a consequence of maintaining potable water supplies.

3. Summary and Conclusions

Regulation 61 (6) of the Habitats Regulations requires that in forming an opinion as to whether a proposal could adversely affect the integrity of the European site, consideration must be given the manner in which it is proposed to be carried out, or to any conditions or restrictions that might be applied in order to avoid adverse effect.

There is significant scope to increase abstraction within the existing Thorpe St Andrew licence, from a recent average of 8.4 Ml/d to the maximum licensed equivalent of 13.7 Ml/d at the Thorpe St Andrew borehole. This would require investment in boreholes and associated infrastructure; Anglian Water has planned investment at Thorpe St Andrew for the AMP6 period (2015-2020). The abstraction has been subject to an appropriate assessment and has been through the Review of Consents process. There is no indication that increased abstraction at Thorpe St Andrew would cause adverse impact on the River Wensum SAC. This was the area specifically referred to in the Scope; however, there is also no indication that there would be any adverse impact on the Broads SAC or Broadland SPA.

The latest supply/demand balance forecasts produced by Anglian Water Services indicate that water resources are sufficient to provide for the levels of growth anticipated in the Joint Core Strategy up to 2015 and immediately beyond, with actual abstraction at Costessey limited to historic levels. It is agreed by all parties that this will prevent the SAC from deteriorating any further as a result of abstraction pressure.

In the longer term, additional resources will need to be made available in succeeding Asset Management Plan periods. Anglian Water Services is already in discussions with the Environment Agency about source development to enable them to reduce abstraction at Costessey without jeopardising their ability to meet demands and have agreed to identify their preferred approach in 2012. The longer term solution may require its own assessment under the Habitats Regulations.

The conclusion of this study is that in the period to 2015, the levels of growth anticipated in the Joint Core Strategy can be provided with potable water without further detriment to any areas protected under the Habitats Regulations.

Growth proposals which prevent or delay implementation of a solution to remove adverse effect on the river Wensum SAC from licensed abstraction would not meet the requirements of the Habitats Regulations and would not be consistent with policy 1 of the JCS.

4. References

Habitats Regulation Assessment: Joint Core Strategy for Broadland, Norwich and South Norfolk, Mott MacDonald February 2010,

Joint Core Strategy for Broadland Norwich and South Norfolk: Proposed Submission Document November 2009 (Appendix 6)

Greater Norwich Development Partnership: Stage 2b Water Cycle Study, Technical Report-Final, Scott Wilson February 2010

Guide to Information from National Abstraction Licensing Database (NALD) Version 2.0 Environment Agency May 2006

River Wensum SAC - Site Action Plan Version 5.0 (redacted) Environment Agency, August 2010

Guidance Note on Growth and Water in Greater Norwich, Environment Agency, August 2010.

Statement of common understanding on water resources. Anglian Water, Environment Agency, Natural England – 3 November 2010

Clarification by Anglian Water Services of their evidence to the public examination into the joint core strategy for Broadland, Norwich and South Norfolk - 17 November 2010

Monaster, Steve (2012). Email to Peter Ede, Mott MacDonald, 27 Jan 2012.

Appendices

Appendix A. Scope for Study

The scope of the study in terms of its time horizon is from the present to the beginning of the next Asset Management Plan period in 2015.

The study should look at existing licensed abstraction capacity in the area close to Norwich, and in particular at licensed abstractions at Thorpe St Andrew. In particular it should consider whether fully utilizing the Thorpe St Andrew licensed abstraction to cater for development in the short term, combined with an undertaking by AWS not to increase actual abstraction at Costessey, even within existing licenses, would avoid damage to the River Wensum SAC, and thus comply with the Habitats Regulations.

In doing so, the study should verify that the abstraction currently licensed at Thorpe has been subject to an appropriate assessment and been through the review of consents process and concluded as having no adverse effect on European sites. It should also take into account any relevant requirements of the published review of consents, and any measures included in Anglian Water's Asset Management Plan covering the period to 2015.

The study should include relevant consultation with Natural England, the Environment Agency and Anglian Water Services as well as the client.

The study should quantify any resources identified which may be available for development in terms of megalitres per day, and express this as an equivalent in terms of dwelling equivalents at differing levels of the code for sustainable homes. It should relate these estimates to the published housing trajectory in the submitted Joint Core Strategy and assess the extent of any additional capacity in the period to 2015.

Appendix B. Anglian Water Memorandum

This appendix contains a memorandum provided by Anglian Water to clarify its commitment to reduce abstraction as part of the interim 'agreement of common understanding'. It is followed by the text of an email from Anglian Water that states that AW are still committed to restricting abstraction at Costessey to historic levels until delivery of the interim solution.

anglianwater

memo

to:	Iain Page; Helen Ward; Mike Burrell; Sue Bull; Mike Cook; Steve Moncaster
from:	Jayne Owen
copy:	
our ref:	GNDP EIP
your ref:	AW
subject:	GNDP EIP
date:	17 November 2010

Following Anglian Water's (AW) representation at the Greater Norwich Development Partnership Examination in Public on the 11th November (Matter 8) we feel that our explanation regarding the 20Ml/d sustainability reduction on the Wensum and our commitment to reducing abstraction at Costessey to historic levels (6Ml/d decrease) as part of the interim 'agreement of common understanding' requires further clarification:

The Environment Agency (EA) as part of its Review of Consents (RoC) under the Habitats Directive identified the River Wensum Special Area for Conservation (SAC) as presently having unfavourable conditions in relation to water quality, abstraction, siltation and physical modifications to the channel. The RoC Stage 3 appropriate assessment identified that the river reach between the Costessey Pits Intake and the limit of the SAC at Hellesdon Mill does not achieve the Habitats Directive Environmental Required Flow (HDERF) and fully licensed AW abstraction at Costessey has adverse effects.

Consequently, the EA identified that a significant reduction in flows, especially in the lower reaches are required for the site to meet its environmental objectives. This includes the need for a reduction in the AW Costessey abstraction of up to 49 million litres per day (Ml/d) to be achieved progressively over successive business planning cycles. This would involve an initial 20Ml/d reduction in the short term.

We are currently appraising the options available to achieve the initial reduction of 20 Ml/d and have committed to outlining our preferred option by January 2012. Until the solution is in place we have agreed to prevent any further deterioration of the River Wensum SAC by restricting the level of abstraction at Costessey to historic levels. This is defined as the annual average abstraction in 2005 which leads to a 6 Ml/d reduction in the Norwich and the Broads (NTB) WRZ.

The draft Norwich Joint Core Strategy (JCS) document sets out an aim to build approximately 22,500 households between 2010 and 2020. As part of the consultation process for this strategy Natural England have advised that any proposals coming forward ahead of the adoption of the JCS and the implementation of the RoC solution for the River Wensum SAC should not act to exacerbate the adverse affect on the Wensum by involving increased abstraction from Costessey.

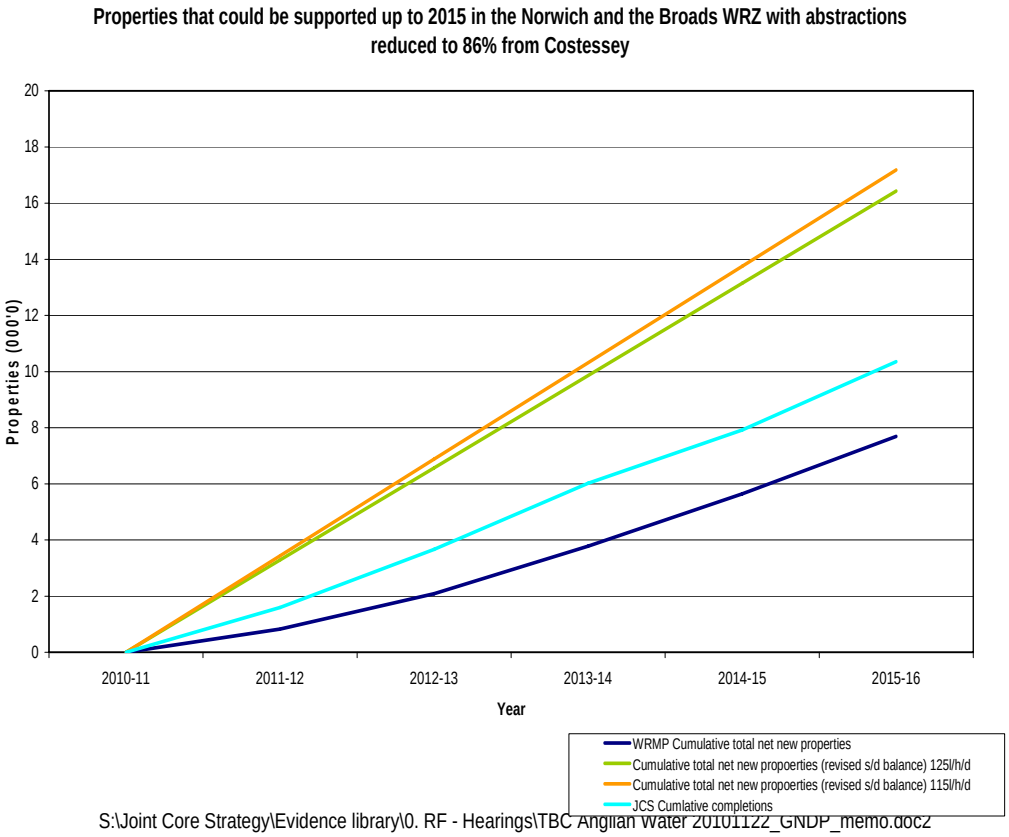
As part of our 'common understanding agreement' with the Environment Agency and Natural England we committed to undertake an assessment into the level of growth that could be accommodated by our existing sources over AMP5 with the inclusion of the reduced abstraction at Costesssey to historic levels (2005). Our assessment is based on outputs from our Water Resources Management Plan (WRMP) final planning scenario (WRP4) for the Norwich and the Broads WRZ, February 2010 and is summarised below:

Description	Units	2010/11	2011/12	2012/13	2013/14	2014/15
Norwich & The Broads (NTB) WRMP supply demand balance	Ml/d	10.21	10.11	9.72	9.02	8.22
Revised supply demand balance (capped abstraction from Costessey)	Ml/d	4.22	4.12	3.73	3.03	2.23
Cumulative new Properties included in WRMP (WRP table 4)	000's	0.82	2.09	3.78	5.65	7.69
Additional build capacity at 125 l/h/d (using the revised supply demand surplus)						8.74
Additional build capacity at 115 l/h/d (using the revised supply demand surplus)						9.50
Total build capacity at 125 l/h/d (including WRP forecast)	000's					16.43
Total build capacity at 115 l/h/d (including WRP forcast)	000's					17.19

Norwich and The Broads WRZ revised supply demand balance and build capacities

With the revised supply demand balance of 2.23 Ml/d we would be able to meet our growth forecasts of 7,690 properties and also accommodate an additional 8,740 properties (based on 125l/h/d consumption) or 9,500 properties (based on 115 l/h/d consumption) by 2015. At this level of growth we are able to maintain our levels of service commitments to our customers and our supply demand balance remains in surplus.

By annualising the total build capacities that could be supported under the two consumption rates we would be able to fully support the property growth forecast in the Joint core strategy as shown in the graph below.



Our demand forecast assumes that the population served will increase between 2010 and 2035, having taken into account the current economic downturn and the expected recovery from it. In our WRMP we also assumed an overall decline in measured water consumption to 130l/h/d by 2030. These growth forecasts have been scrutinised and accepted by our regulators.

On the basis of this assessment, the forecast level of growth outlined in our WRMP would be achievable under the revised abstractions from Costessey and we are confident that the JCS housing projections could also be supported.

From: Bull Sue [mailto:sBull@anglianwater.co.uk]
Sent: 18 May 2012 17:16
To: Roger Burroughs
Subject: FW: JCS HRA Addendum

Dear Roger

The response from Jessica Bowden (EA) appears to raise two issues:

1. Whether or not AW are still committed to the terms of the Joint Position Statement issued in November 2010. In particular that we will restrict abstraction to historic levels pending delivery of the interim solution to deliver a 20 Ml/d sustainability reduction by 2015
2. That we are putting into place arrangements for achieving a 20 Ml/d reduction in abstraction at Costessey by 2015.

AW are still committed to restricting abstraction at Costessey to historic levels until delivery of our interim solution. This solution (a temporary transfer of abstraction from Costessey to Heigham) is in the process of being delivered and details are given in the report that we have recently issued to the EA.

I hope this helps to clarify.

Regards

Sue Bull
Planning Liaison Manager
Anglian Water
Asset Management
Thorpewood House
Thorpewood
Peterborough, PE3 6WT
t: 01733 414605 m: 07885 135312