

## 9 Scope of Stage 2

The overall scope of Stage 2 should be to build upon the main constraints for the Potential Growth Areas identified in the Stage 1 report. It should identify the infrastructure required to overcome the constraints in all of the potential growth areas to inform the Joint Core Strategy. Stage 1 of the Water Cycle Study has identified that the following is required within Stage 2:

### 9.1 Proposed Growth Areas

The following is required in relation to all Proposed Growth Areas:

- A review of the conclusions within Stage 1 in terms of the appropriate Potential Growth Areas should be undertaken.
- Identify any of the constraints for development in light of the following:
  - Water Framework Directive
  - Joint Core Strategy
  - Regional Spatial Strategy
- In light of the findings from Stage 1, identify the potential for development without additional investment, with relatively “small” capital investment and with relatively significant investments. This should, take account of all constraints including potential environmental effects.

### 9.2 Constraints

#### 9.2.1 Flood Risk and Hydrology

A key missing data source for Stage 1 of the Water Cycle Study was the Strategic Flood Risk Assessment (SFRA). Completion of this should be progressed as a priority to enable it to be incorporated into Stage 2. Key elements that are required from this include:

- Updated floodplain maps for the 1 in 100 year and 1 in 20 year (functional floodplain) return period for fluvial systems and the 1 in 200 year floodplain return period for tidal systems;
- The impacts of the predicted climate change onto these floodplains;
- The assessed flood risk from surface water runoff within each of the Potential Growth Areas, especially within Wymondham which has been identified as having related drainage problems;
- Identification of the required infrastructure to improve, where necessary, the flood defences in order to facilitate the required growth in each of the Potential Growth Areas. This should again be informed by the SFRA which should provide an assessment of the condition of the defences;

- Undertake a study to ascertain the capacity of the receiving watercourses within the Study Area.;
- The assessment of the potential SUDS schemes identified in the SFRA which can be implemented in the Study Area should be considered in light of incorporating this into an overall water strategy to:
  - Address any flood risk issues;
  - Provide additional storage capacity for water resources;
  - Provide a means for increasing groundwater recharge.

### 9.2.2 Water Resources and Supply

Stage 2 of the Water Cycle Study needs to address the following in terms of water resources:

- Provide greater clarity on the effects on groundwater of development, particularly in Norwich, where this has been identified as a major issue.
- Considerable liaison with Anglian Water Services is required to:
  - Review the water resource plans for the area (to be published in early 2008);
  - Review the demand forecasts to see what growth has been included. This review should be carried out at Water Resource Zone level (of which there is likely to be three covering the Greater Norwich area).
- Identify any potential local water infrastructure constraints to the development of specific areas and the infrastructure required, if possible, to overcome these;
- Use the SFRA to review of the local geology in terms of the options for groundwater recharge and water supply in conjunction with the widespread use of SUDS;
- A review the raw water quality, mainly of the groundwater sources and to identify any problems. Deteriorating water quality (mainly by nitrates) is likely to be the major problem that AWS will face with many of its isolated groundwater sources and where the options for blending are limited.
- Undertake a review of the phosphate levels in the watercourse and ascertain the impact of development on these;
- Assess any potential constraints on future water resources by climate change;
- The Review of Consents process should be fully incorporated into Stage 2 once the results have been determined. Although the discharge and abstraction issues are considered in isolation in relation to each of the Potential Growth Areas, the combined effect of this should be assessed throughout the Study Area. It should identify through Environment Agency Review of Consents methodologies, the overall ceiling for development within the Study Area for each combination of developments. This would give context as to which combinations of development might be viable and sustainable.

### 9.2.3 Wastewater Drainage and Treatment

The scope of Stage 2 in terms of the wastewater drainage and treatment should include the following:

- The development of (if necessary) or the upgrade of, an appropriate hydraulic model of the existing sewer network. This will enable the assessment of the capacity of the existing sewers within the Potential Growth Areas, and will inform the Possible Dwelling Scenarios in terms of the availability to develop within the existing infrastructure. This will need to be undertaken in conjunction with Anglian Water Services;
- Once the appropriate Possible Dwelling Scenarios have been identified and agreed with the stakeholders<sup>17</sup>, then further hydraulic modelling will be necessary to inform the design of any proposed infrastructure required. The model should be developed so that it can inform the distribution of proposed developments;
- Further clarification of the existing capacities of the STWs, potential process “bottle necks” within them and options for upgrading or improving STWs should be undertaken;
- Once the options for potential growth in each of the Potential Growth Areas has been identified, then the required infrastructure for providing the necessary service to these will need to be identified. It is advised that the option numbers are limited for each Potential Growth Areas to minimise the permutation that can be undertaken and avoid abortive work;

### 9.2.4 Environment

The scope of Stage 2 should address the following points:

- Undertake further study on the existing and potential phosphate discharges into the receiving watercourse (particularly the Rivers Yare and Wensum). The impacts on the downstream areas such as The Broads should be assessed in conjunction with Natural England and the Broads Authorities;
- Stage 2 will aim to quantify the likely increase of phosphates into the receiving watercourse in light of the Review of Consents, and where possible, provide costing on the required improvements to the STW process to mitigate against this;
- Further investigate the sensitivity of those SSSIs that have been identified as potential constraint on development areas;
- The Review of Consents results should be wholly incorporated into Stage 2, to include not only the Study Area, but the Redgrave and Lopham Fens SSSI and Blo’ Norton & Thelnetham Fens SSSI, where water resources issues have been identified.

## 9.3 Other

Other aspects of the Water Cycle Study that will be required in Stage 2 include:

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<sup>17</sup> The Government housing targets will need to be met

- In conjunction with Anglian Water, identifying the phasing of their works to align the potential development on this study;
- Once the estimated capital cost of the projects have been identified, it should be assessed where possible and to what extent, developers can contribute financially to the implementation of the schemes. It is likely that a strategy will have to be formulated which will provide incentives for developers to invest into the project;
- If necessary, the provision of a developer checklist should be undertaken. This will provide guidance for developers in terms of a sustainable approach to development, and also act as a single development guide to avoid repetitive planning applications that will strain existing resources and finances.