

## SOUTH LINCOLNSHIRE RESERVOIR

## FENS RESERVOIR

### OVERARCHING AMBITION AND DESIGN PRINCIPLES

#### Revised for Gate 2 submission

#### Overarching Ambition

Most of the region served by Anglian Water and Cambridge Water, including the catchments of the River Witham, River Welland, River Nene and River Great Ouse, drains into the Fens. The existing water management system for the Fens was designed and built in the 17<sup>th</sup> century to drain water into the North Sea as efficiently as possible. As the marshland of the Fens was drained, it became the most productive agricultural land in the country.

Four centuries later, our needs on water demand have changed. Today, many more people live in the East of England and larger quantities of water are required to support modern lifestyles. Climate change is leading to hotter, drier summers and more frequent droughts, and is also increasing the frequency of intense precipitation events. Chalk streams, one of our most precious habitats, are running dry. The evaporation of peat from dry fenland soils emits huge amounts of CO<sub>2</sub> into the atmosphere, contributing further to climate change.

We now need a different strategy for water management in the Fens, that integrates the need to retain more water on land for human consumption, manages flood risk and drainage, protects the environment and supports the Fens' thriving agricultural sector. The two proposed reservoirs and their wider systems will be key elements in delivering this change.

Ambition Statement

In response to climate change and the need to live more sustainably in the 21<sup>st</sup> and 22<sup>nd</sup> centuries, a radical transformation is needed in the way water is managed in the East of England. Fens Reservoir and South Lincolnshire Reservoir will play a central role in this transformation, delivering secure, resilient water resources to meet the needs of people and the environment. Integral to this, the projects will also deliver benefits for biodiversity, recreation, health and wellbeing. Subject to funding and support from partners across the region, significant wider benefits can be delivered, including for the economy, agriculture and industry.

The reservoir projects will be exemplars of good design. They will be developed and delivered in collaboration with local people, stakeholders and regulators at all stages to ensure their concerns are addressed, particularly during the long construction period. The projects will deliver a positive legacy for the communities and places they affect, inspiring local and regional pride.

**Overarching Design Principles**

<b>ACWG DESIGN PRINCIPLES</b>	<b>OVERARCHING DESIGN PRINCIPLES FOR EAST OF ENGLAND RESERVOIRS</b>
<ul style="list-style-type: none"> <li>- These principles have been agreed by the All Company Working Group and apply to all SRO projects</li> <li>- They are included to provide context for the overarching principles</li> </ul>	<ul style="list-style-type: none"> <li>- Draft principles, relating to both SLR and Fens reservoirs and the wider systems and transfers work</li> <li>- They are mapped against the ACWG principles to demonstrate how those principles are applied to the East of England reservoirs projects</li> </ul>

<p><b>1. Be Specific</b> Develop project-specific design vision and principles based on an understanding of the objectives of each project and the people and places it will affect.</p>	<ul style="list-style-type: none"> <li>• Addressed through design narratives</li> <li>• In the design narratives, visions and principles, the 'project/projects' comprise the reservoirs, abstraction points and transfers</li> <li>• The narratives, visions and principles will continue to inform the development of the wider system concept that is being developed in collaboration with multiple stakeholders</li> </ul>
<p><b>2. Safe and Well</b> Actively and collectively develop designs that can be built, used and maintained without unacceptable risks to the health and safety of workers - particularly during hazardous construction and operational activity. Manage risks to members of the public thoughtfully with an approach that balances maximising wellbeing benefits with protection from risks that could cause significant harm.</p>	<ul style="list-style-type: none"> <li>• Deliver appropriate access to green and blue infrastructure (including during construction) to maximise wellbeing benefits for local people and visitors at all stages of the project lifecycles</li> <li>• Ensure the projects can be constructed and operated safely whilst delivering wellbeing benefits</li> <li>• Ensure the projects do not increase flood risk to surrounding areas</li> </ul>
<p><b>3. Climate</b> Mitigate greenhouse gas emissions and adapt to climate change</p>	
<p><b>A Nature knows no boundaries:</b> Water is essential to all life and managing our response to climate change is a collective and urgent activity. Projects must be developed to work across companies and/or legislative boundaries to develop</p>	<ul style="list-style-type: none"> <li>• The reservoirs will be designed to be part of an integrated water supply network to secure water supplies in the face of a changing climate</li> </ul>
<p>sustainable solutions and environmental enhancement for the wider benefit of society.</p>	<ul style="list-style-type: none"> <li>• Demonstrate working with other relevant water companies on cross-boundary concerns</li> <li>• Explore opportunities for the projects to contribute towards regional sustainability strategies and the development of environmental, social and agricultural resilience</li> </ul>

	<ul style="list-style-type: none"> <li>• Work with relevant stakeholders throughout the wider systems area</li> </ul>
<p><b>B</b> <b>Resource and carbon efficient throughout:</b>          Projects shall seek to reuse existing assets, eliminate waste (including waste of water) and make efficient use of materials and transport across the whole of the project lifecycle.</p>	<ul style="list-style-type: none"> <li>• Enable net zero operational emissions in-line with the water industry's routemap.</li> <li>• To enable net zero the design will minimise emissions, maximise renewable energy and seek to develop carbon insets and offsets</li> <li>• Whole life carbon and cost will be reduced by applying principles from both the HM Treasury's Infrastructure Carbon Review (2013) and the global standard for managing infrastructure carbon (PAS 2080)</li> <li>• Set ambitious targets against robust baselines and implement effective monitoring and reporting</li> <li>• Ensure strong leadership, good governance and effective collaboration across the value chain</li> <li>• Optimise designs and engage early with the supply chain to develop lower carbon options for hotspots including excavation, transport, pipe materials and civil structures</li> <li>• Develop a sustainable travel and transport plan for operation and construction</li> <li>• Promote sustainable water consumption and minimise waste of water during design, construction and operation</li> <li>• Explore opportunities to re-utilise existing and proposed assets</li> <li>• Sustainable materials to be specified wherever possible</li> <li>• Develop a waste management strategy to minimise waste during construction</li> </ul>

<p><b>C Resilient and adaptable:</b> Design for anticipated future demand at the appropriate scale. Build in the resilience to absorb and recover from the impacts of the extreme events and incremental stresses likely to arise from climate change.</p>	<ul style="list-style-type: none"> <li>• Ensure the project is resilient and adaptable, having considered a range of climate scenarios during design as per best practice e.g. the Task Force on Climate-Related Financial Disclosures (TCFD) and the supplementary guidance to HM Treasury’s Green Book</li> <li>• Design to ensure not just the resilience of the public water supply but also the environmental, recreational, community and other aspects of the project.</li> <li>• Use best practice in resilience planning to design-in resistance, reliability and redundancy whilst ensuring the ability to respond and recover</li> <li>• Collaborate with other regional stakeholders to ensure adaptation strategies are integrated</li> <li>• Use the latest climate science and most recent climate projections to inform design</li> <li>• Design the projects to respond to anticipated development and other foreseeable changes over the longest term, including changes in technology increased demand for recreation facilities</li> <li>• Design the projects to be able to respond to flooding, drought and sudden increases in water demand whilst maintaining ecological and recreational performance</li> <li>• Support the resilience of food production through improved flood protection for farmland, improving the retention of water in soils and increasing the availability of water for irrigation</li> <li>• Seek to facilitate diversification opportunities in the surrounding area for local landowners and land managers</li> </ul>
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**4. People**  
Reflect what society wants and share benefits widely

<p><b>A Understand and respond to your community's needs:</b> Develop a full understanding of the social context that will be impacted by the project over its lifecycle. Design for how local communities will</p>	<ul style="list-style-type: none"> <li>• Demonstrate an understanding of the context of the reservoirs, transfers and other elements of the projects, identifying the people who will be affected by or interact with the projects during construction or operation</li> </ul>
<p>encounter the infrastructure in their everyday lives during both construction and operation.</p>	<ul style="list-style-type: none"> <li>• Demonstrate an understanding of those who will construct, operate and maintain the projects</li> <li>• Research local demographic, economic and lifestyle data and trends to understand the constraints and opportunities arising from the social context</li> <li>• Early engagement and partnership with host local authorities and other stakeholders (including South Lincs Water Partnership and Fens Water Partnership), seeking to deliver social and economic value</li> <li>• Early engagement with local communities, ensuring a diverse range of perspectives are engaged</li> <li>• Identify concerns for local people during construction and operation</li> <li>• Identify aspirations of local people and water company customers</li> <li>• Identify opportunities to address concerns, fulfil aspirations and provide other benefits, such as opportunities for local businesses</li> </ul>
<p><b>B Engage widely, early, and meaningfully:</b> Work with stakeholders and local communities to develop their understanding of the importance of nature and water conservation. Incorporate and balance the views of communities in aspects of the design of infrastructure and associated landscape wherever practicable.</p>	<ul style="list-style-type: none"> <li>• Celebrate the purpose and context of the projects to engage the public and relevant stakeholders in wider water management issues</li> <li>• Focus on educational opportunities at all ages (lifelong learning) during both construction and operation</li> <li>• Explore opportunities for communities to engage in design</li> <li>• Identify opportunities for the local economy and employment, including skills training for local workers</li> </ul>

	<ul style="list-style-type: none"> <li>• Creative interpretation of the reservoirs, transfers and wider system and landscapes in which they are located</li> </ul>
<p><b>C Improve access and inclusion:</b> Consider how people move around your works. Maximise opportunities to support active travel and improve recreational access to waterside and green spaces that can improve outcomes for wellbeing, health, local economy, social inclusion, and education.</p>	<ul style="list-style-type: none"> <li>• Provide public access to as many areas of the projects as possible</li> <li>• Provide appropriate accessible routes to all public areas, recognising that some routes will not be accessible to all</li> <li>• Maximise use of sustainable and active transport networks, including consideration of opportunities such as enhanced rail and waterborne connectivity</li> </ul>
	<ul style="list-style-type: none"> <li>• Identify opportunities to enhance sustainable and active travel routes for local communities</li> <li>• Seek to reduce inequality and improve social inclusion by improving local access to open space</li> </ul>
<p><b>5. Place</b> Provide a sense of identity and improve our environment</p>	
<p><b>A Take care:</b> Develop proposals in the spirit of stewardship looking to both the past and future of each context to understand and develop its landscape, cultural heritage, health, and sustainability. Work with partners to secure the long-term success of all measures.</p>	<ul style="list-style-type: none"> <li>• Research/assess the environmental character of the project sites and context, collaborating with specialist consultants</li> <li>• Identify trends, challenges and opportunities for the future</li> <li>• Establish the short-term and long-term zones of influence of the projects beyond the application boundaries</li> <li>• Design the projects to respond to their existing and anticipated environmental context</li> <li>• Minimise adverse impact on the environment through collaboration with specialists and stakeholders</li> <li>• Take cues from the environmental context to add richness and value to the design</li> </ul>

	<ul style="list-style-type: none"> <li>• Early engagement during the design process with partners who will manage and maintain the projects in operation</li> </ul>
<p><b>B</b> <i>Protect and promote the recovery of nature:</i> Focus on the role of landscape, its capacity to accommodate infrastructure and shape places. Work collaboratively and employ holistic, landscape-scale approaches that support and deliver biodiversity net gain as well as multiple other benefits.</p>	<ul style="list-style-type: none"> <li>• Engage ecologists creatively at all stages of design process</li> <li>• Identify opportunities to deliver benefits, beyond meeting biodiversity net gain requirements, based on comprehensive ecological assessments</li> <li>• Take a landscape-scale, system-wide approach to nature, identifying trends, challenges and opportunities for the future and seeking to protect, restore and enhance local and regional habitats</li> <li>• Explore partnership opportunities with nature conservation organisations</li> </ul>
<p><b>C</b> <i>Design all features beautifully, with honesty and creativity:</i> Our utility infrastructure can be a source of pride and a positive contribution to its context. Develop proposals that reveal and celebrate its importance, provide visual delight and leave a positive legacy.</p>	<ul style="list-style-type: none"> <li>• Appoint a design champion to ensure a creative approach is taken to all aspects of design throughout to achieve innovative, exemplar projects that leave a positive legacy and generate local and regional pride</li> <li>• Embed the design vision and principles across the design team and hold all members of the team to account against them</li> <li>• Design holistically, responding to environmental, social and economic constraints, aspirations and opportunities and considering both short-term and long-term</li> <li>• Aim for betterment over the existing situation wherever possible and avoid mitigation-led design</li> <li>• Make use of an independent design review process</li> <li>• Design to tell unique local and regional stories</li> <li>• Create a regional attraction, drawing visitors to the project</li> </ul>

<p>6. Value</p> <p>Achieve multiple benefits and solve problems well</p>	
<p><b>A</b> <b>Maximise embedded value:</b>                  Work collaboratively across specialisms and with stakeholders to maximise the benefits of the scheme by being smart with the location and arrangement of elements and design of mitigation within the project scope and budget.</p>	<ul style="list-style-type: none"> <li>• Ensure all appropriate disciplines are actively engaged in the design process throughout</li> <li>• Eliminate organisational and cultural barriers to collaboration</li> <li>• Appoint a lead designer to ensure effective collaboration and integrated outcomes</li> <li>• Engage stakeholders throughout the design process</li> <li>• Draw knowledge and understanding from projects worldwide</li> <li>• Identify integrated design solutions to multiple problems/challenges</li> <li>• Promote innovative design through future thinking, research and development</li> <li>• Take a creative approach to mitigating impacts throughout the design process rather than ‘bolting-on’ mitigation after design</li> <li>• Establish a joint reservoir working group to ensure the two design teams share experience and learn from each other</li> </ul>
<p><b>B</b> <b>Understand how you could provide additional value:</b>                  Identify opportunities to contribute wider regional benefits outside of the project scope. In particular look for synergies with relevant catchment management plans and proposals that support the delivery and enjoyment of a healthy water environment.</p>	<ul style="list-style-type: none"> <li>• Consider opportunities arising from the entire system</li> <li>• Identify relevant policies, plans and strategies at the outset and consider how the design can address them</li> <li>• Identify what can be delivered by the core project and what requires additional parties and/or funding</li> <li>• Engage with regional and local requirements for destination leisure &amp; recreation facilities</li> </ul>

	<ul style="list-style-type: none"> <li>• Seek to integrate with wider green infrastructure proposals</li> <li>• Explore the opportunity for the project to support the development of local supplies of renewable energy</li> <li>• Explore opportunities to facilitate residential, business and other development</li> <li>• Seek to improve local services and facilities in both short and long term</li> <li>• Explore the opportunity to use wider infrastructure assets (eg rail corridors/sidings, navigable watercourses)</li> <li>• Re-use/re-purpose construction phase materials and resources</li> <li>• Seek opportunities to integrate with/contribute to wider strategies, eg Future Fens: Integrated Adaptation, EA Flood Risk Management projects and Levelling Up amongst others</li> </ul>
<p><b>C</b> <b>Capture and measure embedded and additional value:</b>          Have a clear narrative about how you are contributing to society beyond the core scope of your project. Quantify these benefits so they can be considered meaningfully in conversations on value, financing and risk. Share your experience and knowledge widely.</p>	<ul style="list-style-type: none"> <li>• Capture and record all decisions on benefits being delivered by the project</li> <li>• Ensure decisions are evidence-based and effectively monitored throughout the project</li> <li>• Consider how to adjust the approach if decisions are not meeting agreed outcomes</li> <li>• Monitor supply chain quality and value</li> <li>• Provide an annual report on performance against the design principles (overarching and project-specific)</li> <li>• Quantify benefits in appropriate terms (not necessarily financial)</li> </ul>
	<ul style="list-style-type: none"> <li>• Use a variety of approaches to communicate benefits to stakeholders and public</li> </ul>

- Share lessons learnt with stakeholders, public, wider water industry and professions

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