

Innovative Modelling For Wetland Restoration

Wetland restoration takes careful planning and a detailed understanding of the complex hydraulic interactions between cells, to allow optimum water management. Envireau Water were approached by our client, a quarry operator, to develop a cost effective and robust model which would be easily interpreted by all stakeholders.



The Challenge

Our client was required to restore a 500 ha site to a conservation wetland to be fed by a high-level carrier 'canal' filled from a river at an abstraction rate of 5m³/s, when required. Due to the size of the wetland the Envireau Water team proposed building a 1D hydraulic model that was both cost effective for our client and verified at that scale.

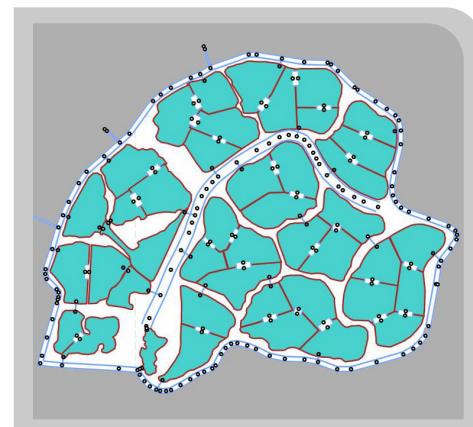
Further challenges included the ability of the canal to be able to withstand high water velocities and wave propagation. The transfer of water from the canal through numerous sluice offtakes into the wetland cells needed careful consideration, as did the volumes of water needed to protect habitats during dry periods, taking account of climate change over a 50 year horizon and how that would be stored within the cell system.



The Envireau Way

Our surface water team chose the Causeway flow modelling software and using their strong working relationship with the developer collaborated to construct a valid model without compromising on the detail of the complex relationships between the different structures in the wetland system.

The hydraulic model was effective in ensuring water was conveyed through the higher cells within the system to lower cells and providing storage of the water in the correct locations. The model also provided the evidence to dismiss concerns regarding unpredictable bow wave effects in the high-level canal, and to show that no flooding could occur within the system or local area.



The Result

Our specialists delivered a cost-effective and technically robust model, demonstrating the complex relationships within the system both numerically and visually, which aided understanding from all stakeholders. The model successfully showed that:



The system could convey large volumes of water into the canal at a high rate and around the wetland, without the risk of flooding.

Following a unanimous acceptance of Envireau Water's model by independent reviewers, the planning and design of the wetland system was able to progress.

Need Our Help?

Our expertise in hydraulic modelling allows us to evaluate and design a range of flood risk management and drainage design solutions. Our ability to develop designs and convey these using different communication methods provides our clients with a holistic approach to clearly understand their water management requirements. Want our support?

Get in touch with our technical lead
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