

Wessex Water:Paulton STW

£3.1 million project delivered one year ahead of Ofwat deadline

by
M. Mackintosh BSc, CEng, MICE & P. Thompson Dip (Eng), BSc, CEng, MICE

Paulton sewage treatment works (STW) is located 10 miles to the south of Bristol and serves a connected population of 12,000. Both pumped and gravity fed flows arrive at the works for treatment in conventional biological trickling filter works. Effluent was treated to comply with the quality consent of 30/40/10 prior to discharge to the Cam Brook, a tributary of the River Avon. The AMP4 National Environment Programme identified that improvements were required to the settled sewage storm overflow. The capacity of the STW needed to be increased to improve the discharge to meet this objective. An increase in the capacity of the STW was also needed to reflect growth within the catchment.



Paulton STW:Sludge holding tanks (foreground); trickling filters/primary tank (background)

Photo: courtesy Wessex Water

The STW was operating at the threshold of the consented Dry Weather Flow (DWF) parameter. A revision to this quantitative limit would trigger tightening of the accompanying qualitative limits which were set at 30:40:10 (BOD:SS:AmN).

Scope of works

Optioneering of three alternative treatment strategies was undertaken in early 2003, with the preferred choice entailing improvements to the balancing tank and inlet works (to accommodate increase in flow) and a new primary settlement tank and tower trickling filters (to provide increased treatment capacity), selected on environmental and economic grounds.

Once upsizing of the STW had been completed, flows would pass through additional grit removal plant prior to settlement in a new conical primary settlement tank. Two new trickling filters of media depth 5m, would receive the settled sewage prior to final settlement in the existing humus tanks. Modifications to

the existing storm tanks, including raised weir levels, would ensure sufficient capacity to meet the tighter storm discharge consent.

Additional sludge generated by the enlarged works would be treated in two new, covered sludge storage tanks. Supernatant liquors were to be returned to the head of the works via the works pumping station. These new tanks would provide both enhanced thickening and reduced odours and would allow for the abandonment of various storage beds whose location was to be used to site the new biological filters.

Delivery strategy

Whilst Wessex Water possesses experienced in-house design and contracting skills capable of undertaking such work, the timing and resource deployment necessary for the STW upgrading, indicated that this opportunity was suited for procurement through its framework consultants and contractors.

The design package was let to *Atkins* in January 2005.

On completion of the detailed design in April, construction tenders were invited with a subsequent award made in June 2005 to TJ Brent (subsequently incorporated into May Gurney) for completion within nine months.

Risk management

Great effort was made to identify and manage design and construction risks. For example, the design of the works allows for future provision of P-removal facilities, should this become a requirement of the Environment Agency. A further risk was the need for close management of the programme to allow for a phased delivery of the new works; continued use of the existing treatment assets was to be maintained throughout the construction activities until redundant structures could be decommissioned with the take over of their new replacement assets. This phased approach of build and de-commission ensured that no new land would be required for the improved STW, reducing both the environmental footprint and the impact on third parties than an otherwise more conventional approach.

Construction

Work on site started at the beginning of July 2005 with May Gurney initially concentrating on providing temporary sludge storage facilities by putting old abandoned beds back into use. This enabled the demolition of redundant works to make space for the new sludge tanks and tower filters, the latter being critical, to the programme. The main civil works were completed during the summer months with a 'mobile' tower crane set up to service the

new primary settlement tank and elevated filter bases. By October, May Gurney was able to turn flows into the new flow distribution chambers and pipelines, and put the new settlement tank on line. The filter tanks and plastic media were in place by Christmas and work was in progress for the associated pumping stations. The main process works were substantially completed by the end of January with just ancillary works and general site reinstatement remaining.

Commissioning and handover

Take-over testing and process commissioning started concurrently in February 2006. testing was completed in March and the new filters achieved the required level of nitrification by early April, well in time for the consent date of 30 June/06

This project was undertaken within a very tight time scale to achieve early compliance - the construction programme being particularly dictated by working in a restricted area at an operational site. All parties worked well together to enable deadlines to be met and ensure the successful completion of the project on time.

This investment of £3.1 million by Wessex Water has secured Paulton Sewage Treatment Works compliance with regulatory requirements - a year ahead of the Ofwat deadline. ■

Note: The Editor & Publishers wish to thank the authors, M. Mackintosh, Project Manager, and P. Thompson, Performance Manager, both with Wessex Water for providing the above article for publication.

LASER 

Operating throughout the UK and Ireland, Laser Special Projects is a leading multi-sector specialist contractor. Our expert knowledge of legislative requirements, innovative technologies and proven systems ensures a comprehensive service from consultation, assessment and specification, through to delivery of the finished project.

Laser Special Projects
Specialists in Water Engineering

Laser Special Projects
Henwick Mill, Martley Road, Lower Broadheath, Worcestershire, WR2 6RG
T 01905 742750 | E gemma.gunter@laser-group.co.uk | www.laser-group.co.uk

 **VolkerWessels** company