

Rosebery WTW

£8.6m budgeted project at critical works

Rosebery Water Treatment Works, situated in the hills to the south of Edinburgh, is a strategic works serving Edinburgh and the Lothians. It currently treats a blend of 40MI/d from two separate reservoir sources through three parallel process streams; slow sand filters (9MI/d), bell pressure filters (9MI/d) and a DAF/RGF process (22MI/d). Scottish Water's Edinburgh & Lothians Strategy required a 60MI/d output from an upgraded Rosebery WTW. In addition the slow sand filters and bell pressure filters were deemed to be beyond their economic life, this coupled with a drive for improved treatment capability determined that both these streams would be replaced.



Rosebery WTW

courtesy Scottish Water Solutions

The drivers for this budgeted £8.6 million Quality and Standards 2 project included reinstatement of headroom, growth and capital; maintenance.

As the existing DAF/RGF process worked well treating the blended water it was decided to extend that process to treat the required 60 MI/day and decommission the slow sand filters and bell filters.

The existing DAF process consisted of three streams of DAFs and 4 single media, declining rate, rapid gravity filters. The design flow through the DAFs was rated at 32MI/d with the filters being capable of 22MI/d. The discrepancy between DAF output and RGF capacity was to allow for clarified water to be filtered by the existing bell filters in times of poor water quality.

The three existing DAFs were modified to become high rate DAFs using Purac's DAF Rapide® process and four new RGFs were constructed in parallel with the existing bank. The four new filters were designed to treat 30MI/day at a hydraulic loading of 6.1m/h. The existing RGFs were uprated to treat 30MI/d, this involved increasing the hydraulic loading from 4.5m/h to 6.1m/h. The filter runtimes had previously been approximately 48 hours; this is anticipated to fall to around 24 hours, as per Scottish Water's functional specification. The potential to alter the filters to dual media will be evaluated following trials of the new DAF process. The use of pumice as the secondary media would allow existing backwash facilities to be retained without modification.

Since the new filters were designed to be the same size as the existing filters it has been possible to use the existing backwash pumps and air blowers thereby reducing capital cost. This was made possible by a facility to tie in to the existing backwash and air mains incorporated into the design when the original plant was built.

Due to the importance of Rosebery WTW as a critical water supplier to Edinburgh and the Lothians it was a requirement of the project that the existing 40MI/d output was maintained during construction work. Modifying the DAFs, one at a time, immediately adjacent to operational DAFs, called for careful planning and precise construction activities. MJ Gleeson liaised closely with Scottish Water's Operational team throughout the construction work to minimise the risk of contamination and therefore loss of plant output.

The increase in plant output and the improved level of treatment requiring an increased use of an alum coagulant has necessitated an extension to the plant's sludge processing capability. A new sludge treatment process with a thickener and sludge press has been added to the works.

This new system has been integrated into the existing thickener and press system to allow an increased flexibility to the current sludge treatment process.

Start date January 2004

Completion date: Summer 2006. ■