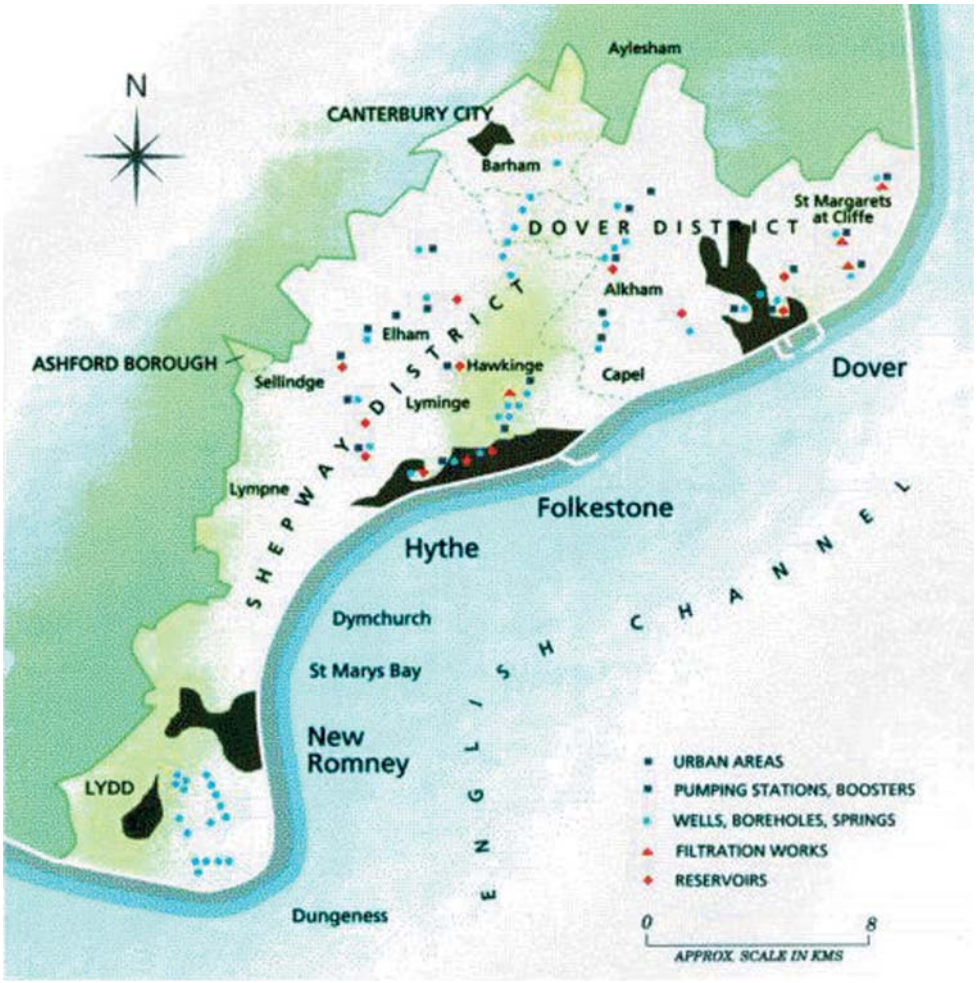
Folkestone & Dover Water-Drellingore PS
new micro-filtration membrane system & plant upgrade

Folkestone and Dover Water has approximately 72,000 customers, with the main sources of supply coming from a large number of small borehole sources sited throughout the company area. The largest single source of treated water supply is from Drellingore Pumping Station, in the Alkham valley, which treats water from a well source within the main site building and also from a nearby satellite well at Lower Standen. The site is located some 4kms northeast of Folkestone and is currently pumped by submersible pumps producing up to 15 Mld via a trunk main to the Hills reservoir - main source of supply for the Folkestone area. The source is subject to turbidity spikes during heavy rain which presents a threat of Cryptosporidium contamination and a temporary loss of the main water source for the area.



Dover & Folkestone Water Company Area, showing treatment plants etc. courtesy: Dover & Folkestone Water

Original treatment at the site was sterilisation by Ultra-Violet radiation followed by marginal chlorination using chlorine gas, injecting chlorine into the raw water main before it leaves the Drellingore site.

Membrane barrier

Scope of the project plant works is to install a Membrane barrier for the raw water sources for a capacity of 15 Mld, using a membrane filter, modify and replace the existing pumping system and layout, replace and uprate the UV sterilisation system and marginal chlorination treatment, and deal with wastewater disposal within a sensitive environmental area.

The existing building was built in 1932 and is very prominent in its setting and surroundings. The new works at the site were to include an extension equal in size to the original building that required negotiation and approvals from the local planning authority. It was agreed that the new structure to house the new membrane and pumping plant would be constructed and finished in similar materials, dimensions, detail and layout to the original. The resulting building extension appears to have been built at the same time as the original.

All existing plant on the station was due for replacement because of age, increased treatment standards or the change of pumping regime due to the new membrane plant (2 stage pumping rather than straight through borehole pumping).

The project included:

* new extension to exactly match existing station, incorporating storage tanks for filtered and backwash water;
* new fixed and variable speed duty/duty/assist borehole pumps and control equipment to include new pumping plant and control at Lower Standen site;
* new fixed and variable speed duty/duty/assist and final booster pumps including all modifications to internal and external pipework with regard to the new plant layout;
* removal of the existing MCC and superseded plant undertaken by FDWS along with development of improved SCADA system;
* construction, installation and commissioning of new CMF filtration plant and all new process and pumping plant, consisting of 3 CMF skids each with 96 membrane modules, chemical tanks and pumps for membrane cleaning and neutralisation, and compressed air systems and pumps for backwash and valve control units, including a *Logica* sub-contract for control software.

CMF Membrane system

It was decided at an early stage to specify *Memcor* continuous micro-filtration (CMF) membrane system for filtration treatment as this system has been used on two other nearby sites in FDWS area and standardisation of treatment systems would be cost effective. The system also has benefits in rural areas with no requirement for off-site chemical waste discharge treatment. (Facilities for final wastewater discharge treatment are limited within the rural and isolated locations of the FDWS borehole sources with no sewer connections available). The main system of cleaning the CMF membrane is pressurised air and water with no chemical additions and the resulting water can be discharged locally to approved locations for surface water or groundwater soakaways. Any waste from CIP cleans of the membrane is neutralised and recycled within the process.

At the start of the project it was agreed that *Veolia Water Partnership (VWP)* would act as Management contractors rather than appoint a main contractor and the individual contracts would be supervised and managed in-house using the experience and knowledge gained from earlier similar treatment plant. This was to include the coordination and agreement of plant layout, civil design contract, planning permission, discharge consent and the award of two major contracts for the new station extension (civil contract) and replacement plant (Mechanical & Electrical contract, including membrane plant supply).

A major element within the project management was the need to maintain the output of the existing plant while the new works were under construction and during EICA plant changeover. At the same time, a new SCADA system for the station to include major additions, changes and modifications was developed to help the passing of information to FDWS central control room in Folkestone.

The Control system used comprises a single PLC (Allen Bradley/ControlLogix) with remote I/O to the CMF skids and DeviceNet link to distributed motor starters adjacent to the process pumps, plus EtheNet connection to the Local SCADA. This can be accessed from Technicians' laptops using wireless comms within the plant buildings, providing display of an event log and analogue parameters. The PLC is connected to a Telemetry Outstation with licensed radio link to the Folkestone Operations Centre, providing supervisory and performance monitoring information.

The site is environmentally sensitive and is classified as an Area of Outstanding Natural Beauty AONB.

Principal sections of the project were undertaken by:

Coffey Construction Ltd/Civil Engineering; Memcor Ltd/ Mechanical & Electrical Works & New Plant; Veolia Water Partnership; - Planning & Contract Management; AJB Consulting Engineers - Building & Civil Structural Design..

Folkestone & Dover Water is part of the Veolia Water group that also includes Three Valleys Water and Tendring Hundred water supply companies.

Civil construction was substantially complete by August 2003 with the new CMF, mechanical & electrical plant and control systems installed, commissioned and operating by March 2004. All, while maintaining the original plant into supply. ■