

Hastings - new WwTW

final phase of £100m environmental scheme

Hastings, historic Sussex seaside town, famous for the battle of 1066 is the setting for a 21st century £100m environmental improvement campaign to deliver a wastewater treatment works and bathing water quality capable of meeting the highest European standards. The first phase has already achieved instant success in meeting European Bathing Waters standards by the construction of large scale stormwater storage facilities. Second phase of the scheme, now under way, is the construction of a new waste water treatment works designed to meet the Urban Wastewater Treatment Directive.



Hastings WwTW under construction (courtesy Southern Water)

Earlier stages of this massive Southern Water project included a 1.6km long (5,250ft) by 6.5m (21ft) diameter tunnel, bored with a *Herrenknecht Mixshield TBM*, to reduce the frequency of storm spills during heavy rain.

The Mixshield system, variant of the slurry tunnelling machine worked between 20m and 60m below ground encountering strata ranging from solid rock to clay and sand, as well as the high water table and associated groundwater pressures and a silted up river bed. Despite technical challenges, the tunnel drive was completed within twelve months.

New treatment works

Located on a remote site on redundant agricultural land, the new conventional works at Pebsham, between the two towns of Bexhill and Hastings, will serve a pe of approximately 150,000.

Full secondary biological treatment will be provided for the first time, thus ending the release of only preliminary treated flows of wastewater from the existing long sea outfall.

Full secondary biological treatment of wastewater flows of up to 922 litres per second will be provided at the works which is designed to meet requirements of the UWWTd. Projected flows for the 2015 design horizon are: 1,050 l/s, which means the plant will have additional spare capacity to meet future demands.

The works will include:

- * screening and grit removal;
- * conventional primary settlement tanks;
- * aeration tanks;
- * final settlement tanks;
- * sludge thickeners;

- * digestion plant;
- * sludge dryer;
- * odour control.

Two pipelines 600mm & 800mm diameter have been constructed underneath the busy A259 coastal trunk road to transfer flows from the catchment pumping stations at Combe Haven, Galley Hill and Coombs, to the new works.

A new 1200mm pipeline has also been built to link the new plant and the existing headworks and LSO at Bulverhythe Tower, for the transfer of treated wastewater. On arrival at the inlet works, flows undergo screening through four, two dimensional 6mm screens. Grit is removed in the aerated grit lanes and combined with the screenings to be taken away to a landfill site. Flows are then transferred into five 13.5m long 7.25m wide and 5.5m deep (538m³) lamella primary settlement tanks to settle out the majority of solid matter and associated bacteria and viruses.

Secondary biological treatment follows in five aeration tanks, 30.12m long by 7.25m wide x 8m deep (1747m³) Process air is supplied by a series of four variable speed blowers and the flows are mixed with activated sludge and then aerated to induce a microbiological action to reduce organic pollutants.

Treated wastewater passes into twelve final settlement tanks before the cleaned flow is transferred under gravity to the headworks for



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release out to sea. A final effluent pumping station is being constructed to boost flows under high tide or high flow conditions.

While there are no immediate neighbours - apart from a pair of Herons which nested alongside the site and produced chicks - the treatment tanks have been 'built in' to the hillside limiting any visual impact on the surrounding area. Good use has also been made of excavated material from site, resulting in an off the shelf design method of protecting the tanks steel reinforced concrete walls from clay bunding. Polystyrene and reinforced netting has been placed against the tank walls prior to the previously dug out clay material, being reused for bunding. This allows the polystyrene to absorb the movement of clay and so protect the structures, while also having key environmental benefits because material has not had to be imported.

Main contractor for the design and build contract is *Morgan Water* which has undertaken a Joint Venture with *OTVB* as principal process sub-contractor. Civil Design is by *Mott MacDonald*

Sludge Recycling Centre

Hastings will be one of Southern Water's key regional sludge recycling centres and will not only treat sludge generated on site but imported cake material from other rural and urban treatment works. It is expected that the centre will treat up to 13,715 tonnes dry solids equivalent each year with 6933 tonnes of imported cake being treated on site.

Sludge is mixed and thickened, before passing into three 2444m³ digesters. The resulting sludge at 5% dry solids is then dewatered to 25% dried solids, using two duty/standby 32m³/hr centrifuges. Dewatered sludge is dried to 92% dried solids in the sludge dryer. This is bagged and stored on site before delivery to agricultural customers for recycling to land as virtually odourless organic fertiliser. Methane gas produced during the process will be stored on site in a gas holder before being recycled back into the works to provide heat for the sludge treatment process.

Southern Water spent considerable time locating a suitable site for the new plant. The decision to use Pebsham was made from both a planning and environmental perspective whilst still ensuring the company's engineering and operational goals could be achieved.

Although the chosen site is not close to housing, the company has ensured that it adopts a good neighbour policy and so the plant is subject to a state of the art odour control system.

Every part of the works that could potentially result in an odour problem is housed within buildings or sealed structures. The process buildings operate under a negative pressure system allowing air to be drawn into the building when access doors are open, rather than foul air being released into the atmosphere. All air generated in these buildings and covered structures is then collected and passed through a single stage chemical scrubbing system housed in a separate building.

When completed in Spring 2003, Hastings and Bexhill join other key tourist resorts along the South Coast to benefit from Southern Water's massive environmental improvement programme. ■

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