

Worthing WwTC

£17m upgrade improves coastal water quality

Worthing WwTW serves a population equivalent of some 140,000 and is capable of providing full treatment of wastewater flows up to 830 l/s. The site has recently seen completion of a two phase, five year £42 million scheme to eliminate the daily release of partially treated wastewater into the sea via a short outfall and odour nuisances.. The need for further treatment became necessary because the waters off the South Coast were no longer afforded High Natural Dispersion Area status under enhanced treatment reclassification in 1998 for coastal works. This meant a further £17m construction work at the plant, which is sited in a densely populated residential area of East Worthing adjacent to a park, golf course and boating lake. However, the additional investment will deliver even further benefits to the quality of sea water off this stretch of coast, and meet requirements of the EU's Urban Wastewater Treatment & Bathing Water Treatment Directives.



Worthing WwTW upgrade works (courtesy Southern Water)

First phase of this major development saw all wastewater from the catchment treated by primary settlement, at the upgraded East Worthing works before release out to sea through a new 4.5km long sea outfall. In addition, a 1km long storm outfall was constructed to release storm flows into the Channel during heavy rainfall, which helps minimise the risk of flooding in the catchment.

This latest £17m phase provides full secondary biological treatment and since completion of the scheme Worthing WwTW now comprises:

* inlet treatment & storm pumps;

- * screening & grit removal;
- * primary settlement tanks;
- * intermediate pumping station;
- * contact stabilisation activated sludge tanks;
- * final settlement tanks;
- * sludge thickeners;
- * sludge storage & pumping plant;
- * digestion plant;
- * digested sludge de-watering plant;
- * odour control system;
- * full information, control and automation systems;
- * washwater systems;
- * liquor & filtrate treatment plant.

Flows arriving at the works pass through two 6mm two dimensional screens to remove rag & larger debris. Grit is then removed into detritors. Grit and screenings are washed and then deposited in skips inside odour controlled buildings before being taken to a landfill site.

Primary settlement

The latest scheme resulted in Southern Water adopting good housekeeping practices, when it utilised some of the existing structures to provide a new biological treatment activated sludge plant. With sufficient storm flow storage within the wastewater catchment collecting system, the original stormwater tanks were converted to provide for additional primary settlement treatment. There are now a total of four conventional primary settlement tanks.

Two tanks measure 56m x 14.5m and 3m deep. The remaining two tanks are 45m x 14.5m x 3.3m deep, giving a total capacity of 9200m³.

In order to transfer flows to the new activated sludge plant an intermediate pumping station was constructed to pass forward flows of up to 830 l/s, using variable speed submersible pumps. Redundant tidal tanks were used for the location of the entire secondary treatment plant including the aeration and final settlement tanks.

Activated sludge plant

The contact stabilisation activated sludge plant comprised four contact zone lanes of 16m x 7m x 5.6m deep and four stabilisation zone lanes of 15.4m by 7m x 5.8m deep, giving a total capacity of 5000m³.

The aeration process air is supplied by a series of four variable speed blowers and effluent from the primary settlement stage is mixed with return activated sludge from the final settlement tanks. The mixture is then aerated to promote microbiological reaction to break down and hence reduce the remaining organic pollutants.

Flows pass to six final settlement tanks, each measuring 42.5m x 10.225m x 3.5m deep and with a total capacity of 8500m³.

The works have been designed to meet the new WwTD secondary treatment standard. Treated effluent is then pumped 4.5kms into the English Channel through the existing long sea outfall.

Sludge recycling

Worthing, like many of Southern Water's treatment works, offers stringently controlled and effective sludge treatment facilities in order to recycle sludge and produce a valuable fertiliser for use in agriculture. The centre can treat 8,000 tonne of dry solids equivalent a year, including some 1,000 tonnes of imported sludge cake material from smaller works also treated on site.

All sludge is thickened and blended before passing into two 2150 m³ digesters. The resulting sludge at 5% dry solids is dewatered to 25% dried solids using two 35m³/hr centrifuges.

Methane gas produced during the digestion process is stored on site in a gas holder before being recycled back into the works to provide heat for the sludge treatment process. Southern Water continues to ensure it adopts a good neighbour policy and so the plant is subject to a state of the art odour control system.

Parts of the works that could potentially result in an odour problem are 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 opened rather than foul air being released into the atmosphere.

All air generated in these buildings and other covered structures is then collected and passed through a chemical deodourisation plant before being released back into the atmosphere through the existing 20m high stack.

Completed in May 2002, Worthing has joined a host of other key south coast tourist resorts which have benefited from Southern Water's massive environmental improvement programme. ■

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Worthing WwTW upgrade works (courtesy Southern Water)