

## Regional Sludge Treatment Centre Northumbrian Water

### *The solution to the problem of sewage sludge disposal*

Entec started work with Northumbrian Water (NWL) in 1993 in the formulation of a long-term sewage sludge strategy. Driven by the EU Urban Waste Water Directive (UWWD) which required the cessation of dumping sewage sludge at sea, the plant was designed and built in two distinct phases over a six year period. Phase one of the plant was brought into full operation in January 1999, whilst the second phase became fully operational in May 2001.

Phase One was built to process up to 50,000 tonnes dry solid / annum (tds/a) of mainly primary sludge. The predicted increase in sludge volumes, coupled with the requirement to include a greater proportion of secondary sludges, required the drying plant to be more than doubled in size (from 15 to 35 tonnes / hr evaporative capacity). Its present capacity is 75,000 tds/a. The regional sludge treatment centre (RSTC) at Bran Sands is the largest operational sludge drying facility in Europe. It can reduce a waste stream of in excess of 1.5 million m<sup>3</sup> of wet sludge to less than 136,000 m<sup>3</sup> of dried sludge.

The concept of drying sludge as a means of treatment was relatively novel in 1993 when Entec started investigations into the options for sludge disposal, with most water companies at that time opting to process sludge via incineration. Furthermore, the plant is relatively unique in Europe as it dries raw (unprocessed) rather than digested sludge. This maximises the potential for the dried sludge to be used as a fuel by maintaining a higher calorific value in the final product and negates the requirement for installation of expensive digestion plant. Since Entec's original investigation, the majority of the UK water companies have mirrored this concept in their sludge disposal strategy and in the design of their new plants.

The plant was the first sludge drying facility in the UK to be licensed under 'integrated pollution control' (IPC) by the Environment Agency (EA) as a waste to fuel plant. In order to obtain this licence it had to be demonstrated that the plant provided 'best available technology not entailing excessive cost' (BATNEEC) and 'best practical environmental option' (BPEO), confirmation of which was endorsed by the granting of a licence for operation in 1998. The application for Phase Two was prepared to meet the expected requirements of 'integrated pollution prevention and control' (IPPC) legislation and was authorised in September

2000 as a major variation to the original licence granted for Phase One.

The plant covers some 3.5 hectares of the 28 hectares Bran Sands site, which it shares with NWL's effluent treatment works. Combining these two projects at Bran Sands was a strategic decision, providing the site with a number of synergies including provision of a combined heat and power plant and eliminating the requirement for a separate sludge liquor treatment plant.

Operating successfully, the plant is recognised to be the jewel in the crown of NWL's operations and is the subject of continual interest by both industrial and water companies throughout the UK and Europe.

### Facts and Figures

**Project**  
Regional Sludge Treatment Plant  
**Client**  
Northumbrian Water Limited  
**Location**  
Bran Sands, Teesside, UK  
**Capital Project Value**  
£114m

### Entec Services

- Comprehensive review of sludge treatment processes employed worldwide
- Assessment of the economics of sludge treatment process (generic and site specific)
- Selection of appropriate drying plant technology via a design competition
- Production of an environmental assessment
- Design of a ground capping system to allow beneficial reuse of a contaminated site
- Geotechnical design
- Mechanical, electrical and civil engineering design associated with the integration of a sludge drying plant including a new jetty, sludge transfer system and sludge storage, drying plant building, HV and LV systems, ICA and SCADA and a Combined Heat and Power Plant (CHP)
- Application and approval of a licence to operate a "waste to fuel" under integrated pollution control (IPC)
- Supervision of construction and co-ordination of multi-disciplined construction contracts
- Technical advice and assistance on the operation of the Plant to improve availability and enhance performance.

