

Bran Sands ETW & RSTC

maintaining NWL's 'flagship' sludge disposal site

by
Tony Mason & Steve Coverdale

Northumbrian Water's award winning treatment works located at Teesport on the east side of Middlesborough, close to the mouth of the river Tees and Corus iron & steelworks provides water and sewerage services in the North East of England with a population served of 2.6 million people. The treatment centre, which has been in operation since 1998 is split into two areas - Effluent Treatment Works (ETW) and Regional Sludge Treatment Centre (RSTC). Since July 2006, Aker Kvaerner Engineering Services Ltd has been employed at this Bran Sands site delivering projects under the capital maintenance framework, with a total framework value of £15-20m over five years.



Bran Sands Treatment Tanks

courtesy Northumbrian Water Ltd

The effluent treatment works treats domestic sewage together with the biodegradable waste from several industrial processes from the surrounding area.

The RSTC is NWL's flagship Sludge Treatment facility, processing both indigenous and external sludges from several Northumbrian Water's sewage treatment works elsewhere in the region. The end product is dried sludge granules and pellets for re-use in agriculture and in the cement making industry.

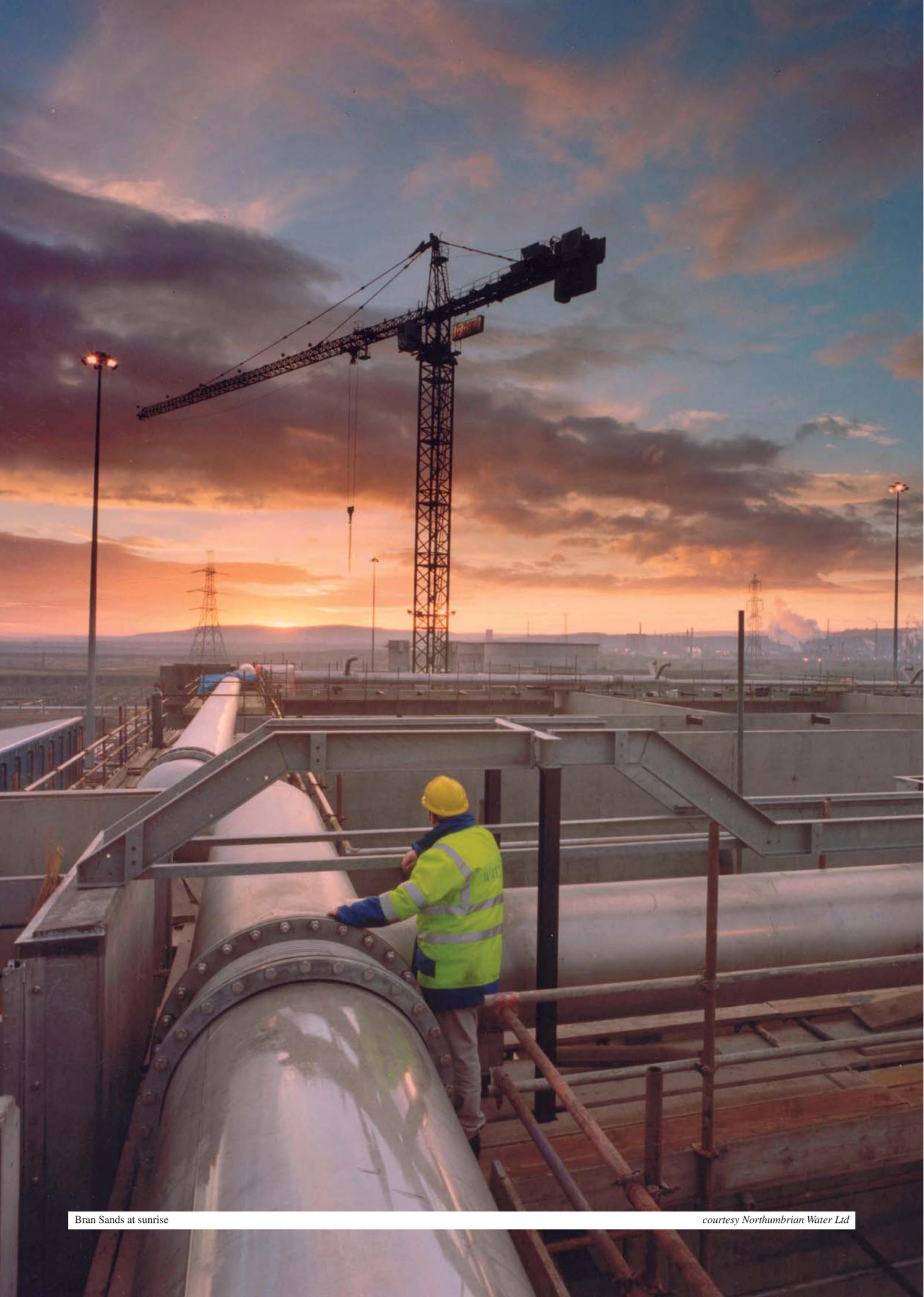
Aker Kvaerner, the Principal Contractor on site is working in

partnership with mainly local contractors to provide Capital Maintenance Improvements works for the NWL Bran Sands site.

The work focuses on the improvement to capital plant to minimise whole life cost, helping to reduce the ongoing site maintenance costs as well as health and safety issues.

Value Management Process to deliver solutions

Delivery of a project can range in value from £20,000 to over £1m but typically begins with the identification of a problem by operational staff and subsequent raising of an asset needs statement. In conjunction with the NWL project team Aker Kvaerner will then



Bran Sands at sunrise

courtesy Northumbrian Water Ltd

undertake a process of problem assessment and solution recommendation, including provision of delivery costs for the option being considered.

The process adds value to the project by looking at alternative solutions to give the client improved product life, better material selection and reduced Operating Expenditure (OPEX) over the design life of the solution. Reviews are carried out at various stages in the optioneering phase to ensure that the most appropriate solution is being considered. Following approval of the selected option, a formal price for delivery will be agreed and the team will implement the works using the NEC suite of contracts.

A key factor that has to be considered in any solution being proposed is the impact of the change upon plant operation, in particular the requirement to shut down plant to install/modify equipment. A dedicated planner is resident at site and ensures that all activities associated with the capital management projects interfaces with the site master programme which manages all routine operational shutdowns.

Typical Value - added solutions

All the pneumatic pipebends in the RSTC Pelletiser area were changed by *Aker Kvaerner* during the one week shutdown in March 2007. The existing carbon steel bends were prone to wearing due to the abrasive product being transferred using a lean phase system. The bends are all located in a corner of the building where the bends converge into the granulate silos, making access awkward. Conversion of the transfer system to a dense phase system was considered, but would not have been cost effective. A more cost effective solution was implemented to install ceramic lined bends which would offer increased periods between bends changes.

Aker Kvaerner have designed and installed fixed access platforms

into an existing dewatering belt kiosk with an inherent problem of restricted space and no permanent access. Health & Safety considerations required scaffolding assembling inside the kiosk every time high level maintenance access was required. The new bespoke platforming will remove the need for temporary scaffolding and reduce the annual overhead expenditure.

Design - alternative solutions

The release of dust during the lorry loading of dried sludge pellets and granules has been a significant health and safety issue for a number of years. The reason for why so much dust was released was due to the existing dust extraction system in the loading spout being inadequate. Additional dust suppression equipment was installed to control the dust levels but did not address the root cause. A patented design cascade chute has been demonstrated, which generates minimal dust emissions and is proposed to replace the existing chutes.

Lessons learned

The last two years have been challenging for the site team to design and integrate solutions into an existing complex operational plant whilst upholding an excellent health and safety record, as recognised by NWL. Key to the success has been close liaison with the site operational staff, aided by having the design and construction team resident at the site in shared offices with NWL project staff. A systemised approach to problem analysis and resolution is now in place, tailored to different scenarios to ensure that solutions are installed as quickly as possible. A number of team alignment workshops have been carried out to ensure that everyone's expectations are addressed and the partnering ethos is maintained. ■

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