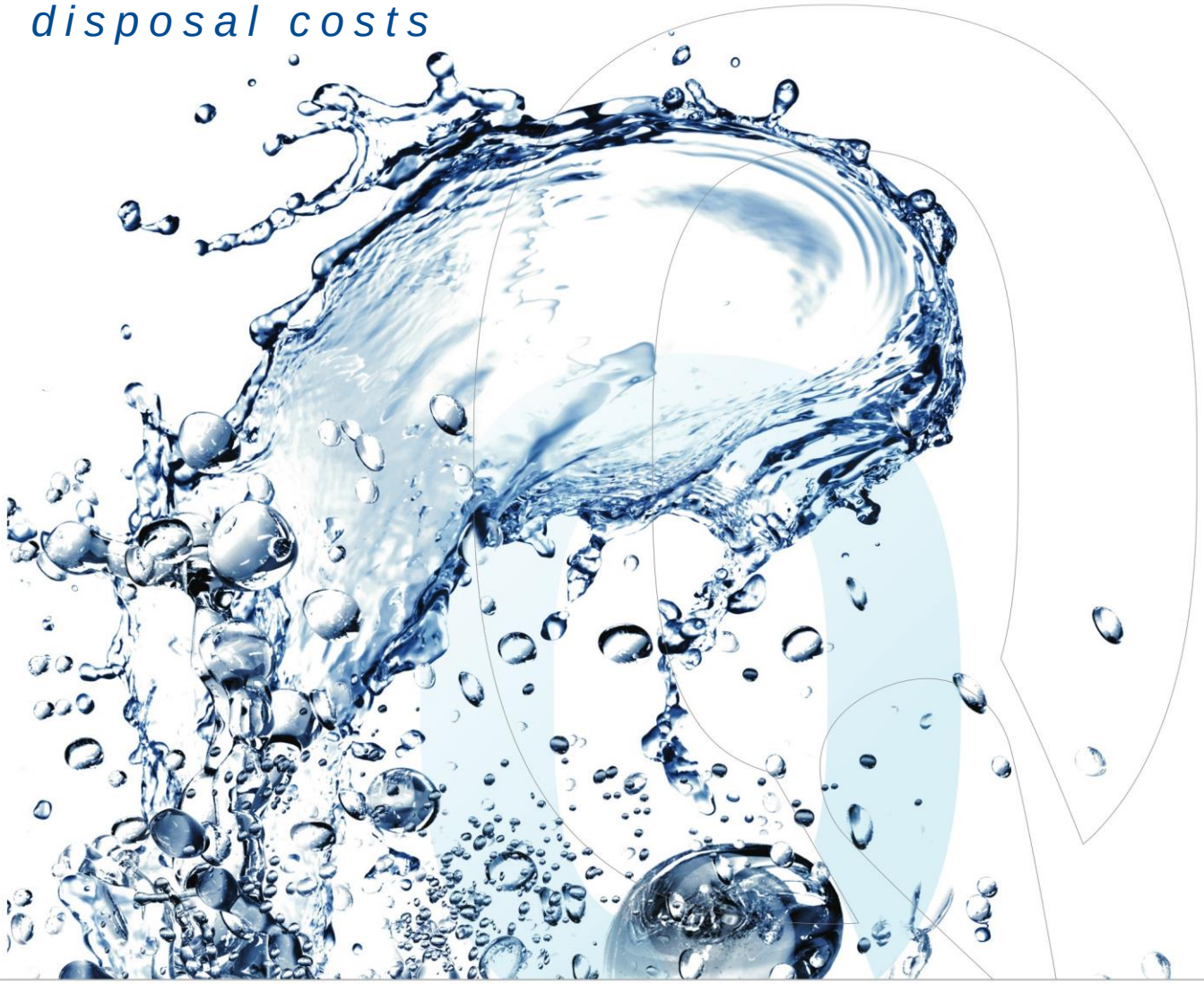
ELIQUO | STULZ

Case Study

Climate friendly wastewater treatment plant with energy surplus and minimal disposal costs



MUNICIPAL SEWAGE TREATMENT WORKS, LINGEN

Lingen's municipal sewage treatment works, with 30 employees, ensures wastewater from the town of Lingen and neighbouring districts in Germany's Emsland region, is collected and treated. The upgrade of the treatment plant is designed for 195,000 PE, treating around 12,000 m³ per day of wastewater.

PROJECT

As part of a project funded by the Federal Ministry for the Environment, Nature Conservation and Reactor Safety (BMU) and the KfW banking group, the Lingen wastewater treatment plant was upgraded in energy self-sufficiency.

Digestion was enhanced by utilising the LysoTherm® system for the thermal disintegration. In the course of the project several configurations were tested, evaluated and compared. In conclusion of the project, the thermal disintegration is operated in a "loop" with the digester.

A further central component of the project was the installation of a phosphate precipitation system. Initially, a two-step-process was operated - Vacuum degassing with EloVac® and subsequent phosphorus precipitation and recovery with EloPhos®. In April 2019 this process was upgraded and simplified by combining the two steps in one. EloVac®-P is a vacuum degassing with simultaneous phosphate precipitation, which provides at least similar operational benefits in terms of an increased dewaterability and lower polymer consumption.

Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit

Umwelt Bundesamt

UMWELT INNOVATIONS PROGRAMM

KFW

STADTENTWÄSSERUNG LINGEN

These measures were supplemented by the installation of new more efficient combined heat and power plants (CHPs) and the use of high-temperature thermal oil exhaust gas heat exchangers for operation of the LysoTherm® system.

IMPLEMENTATION

The project comprised all contract services from design and planning, through delivery, construction and commissioning, to full performance warranty coverage.

SOLUTIONS

- Additional mechanical thickening of the primary sludge
- LysoTherm® system which processes approx. 6,500 kg DS/d (max. capacity: 15,000 DS kg/d)
- EloVac®-P vacuum degassing with simultaneous struvite precipitation out of digested sludge with a maximum throughput of 10 m³/h
- Installation of a centrifuge for dewatering of digested sludge
- Biological digester gas desulphurisation
- 2 CHPs with an electrical output of 300 kW each, plus thermal oil exhaust gas heat exchangers

AT A GLANCE

By implementing a variety of technologies, the capacity and performance of the digestion plant was greatly enhanced and the amount of sewage sludge for disposal significantly reduced.

LysoTherm® – quality in stainless steel

Result

The sludge treatment at the wastewater treatment plant at Lingen was upgraded with new and innovative technologies. The increase in gas production, the reduction in the amount of sewage sludge and the precipitation of phosphorus results in a considerably higher cost-effectiveness.

Scope of services provided

Turnkey execution of the entire project by ELIQUO STULZ

Construction period

2012 - 2017

Total contract sum

Approx. EUR 5.5 million

Wastewater treatment plant Lingen (Ems) – an integrated sludge-energy-nutrient solution

LysoTherm®
Efficient and low-cost sludge disintegration

EloVac®-P
Vacuum degassing with simultaneous phosphate precipitation and reduction of climate-damaging methane emissions

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