

Reference Description Tilbury

Turnkey Drum Drying Plant for sewage sludge
Tilbury, UK



General

In 2005, a turnkey plant contract (Value: approx. 38 million EUROS) was awarded to ANDRITZ by Anglian Water, one of the leading providers of water and wastewater services in the UK. The Tilbury WWTP is located off Fort Road, Tilbury, Essex (to the east of London).



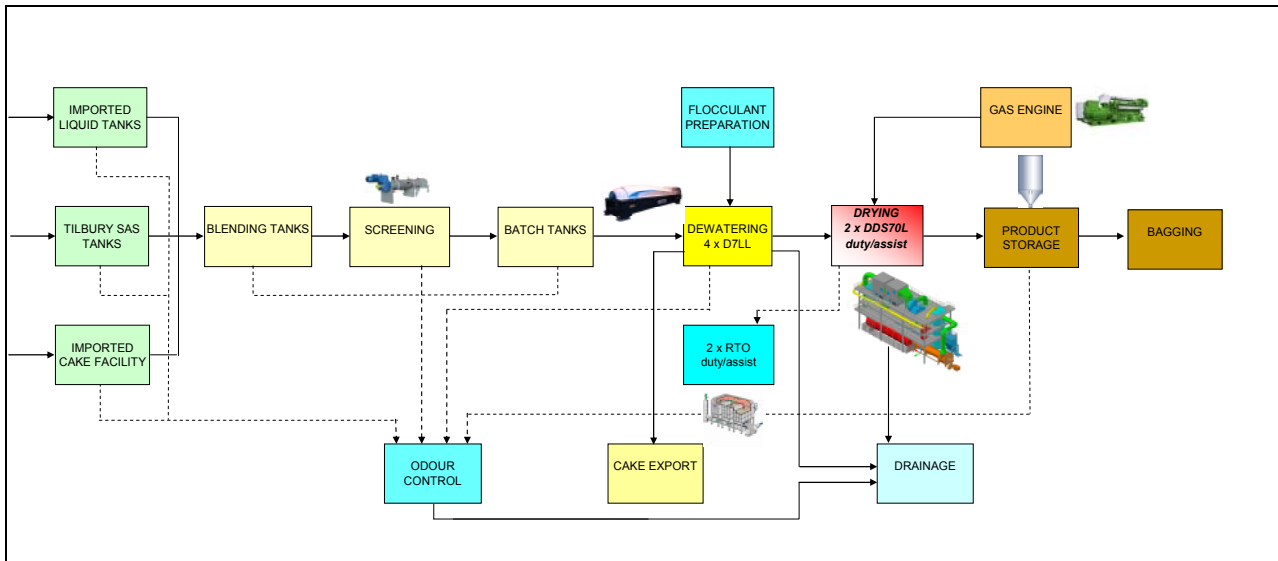
The plant is designed for a sludge throughput of 18,500 TDS/a processed within 6,500 hours and is capable to process SAS from the STW located at Tilbury as well as imported sludge (liquid and cake).

The plant comprises

- Sludge reception facilities (SAS, liquid import, cake import)
- Sludge blending & mixing
- Sludge screening
- Batch tanks
- Dewatering by 4 x ANDRITZ Centrifuges D7LL
- Gas engine & heat recovery
- Sludge drying plant (2 x DDS 70L), each line evaporating max. 7,700 kg water/hr
- Product storage & bagging
- Odour control (bio filter, 2 x RTO)

As main contractor, ANDRITZ was responsible for the civil works including building services and for operation of the overall plant during the commissioning, testing and take-over periods.

Plant description



The plant provides for the treatment of SAS generated from the existing STW (derived from the deep shaft process), imported liquid and cake sludge from satellite works). SAS arising from Tilbury Deep Shaft process is delivered into 2 existing SAS storage tanks

Liquid sludge delivered by tanker is intermediately stored in 2 liquid sludge reception tanks.

Imported sludge cake is logged via a weighbridge and discharged into a reception hopper. From the reception hopper, the imported sludge cake is pumped into a dedicated sludge cake silo. All sludge to be treated is mixed in blending tanks to form a homogeneously mixed stock solution for further treatment. The blended sludge (liquid, cake and SAS) is screened by strain presses prior to being fed to batch tanks.

Tank farm

Blended sludge is fed to the dewatering centrifuges. Flocculant is prepared for the dewatering process.



Dewatering centrifuges D7LL

Dewatered sludge cake from the centrifuges is discharged into a buffer storage silo delivering it to the sludge drying system. When the dryers are not in operation, the dewatered sludge can be discharged into cake skips.



The drying facility at Tilbury includes a two-stream sludge drying plant (2 x DDS 70L) designed to recover heat from the exhaust gas of a gas engine power generator. The dryers are designed for a maximum water evaporation capacity of 7,700 kg/h per stream. The dried product has a minimum dry solids content of 90%.

The dried and cooled product is stored in product silos and packed into Big Bags.

The product is fully compliant with Enhanced treated Status as defined in the consultation paper "proposals to amend the statutory controls for the agricultural use of sludge" (DEFRA-Oct.2002). Full compliance with HSE 847/9 is given.

Exhaust gas from the drying process is treated in thermal oxidizers (RTOs).



General Data

Project Period:	40 months
Take-Over:	Mid 2008

Design data

Liquid sludge reception & sludge buffer storage	Storage 2 x 300 m ³	4500 TDS/a
SAS reception & storage sludge buffer storage	Storage 2 x 3000 m ³	7000 TDS/a
Imported cake reception & storage	Storage 200 m ³	7000 TDS/a
Blending sludge buffer storage	Tank size 2 x 900 m ³	18500 TDS/a
Sludge straining & screening	6 strainpress units	max. 50 m ³ /h per unit
Batch tanks sludge buffer storage	Tank size 2 x 2700 m ³	18500 TDS/a
Dewatering & flocculant preparation	4 Centrifuges D7LL	max. 80 m ³ /h per unit
Heat generation	2 x 7.2 MW Gas Burners	n/a
Dryer system	2 x DDS70L	max. water evaporation rate 7700kg/h per stream
Product storage & loading	Product storage 2x 150 m ³	n/a
Odour control / RTO	2 x RTO	max. 22000 Nm ³ /h dryer exhaust
Odour control / Bio filter	1 x biofilter incl. scrubbers	max. 22000 Am ³ /h tank aspir. air
Gas engine (CHP)	1760 kW el.	n/a
Heat recovery	1700 kW therm.	n/a

Design sludge throughput of overall plant:	18500 TDS/a
Water evaporation capacity maximum per dryer line:	7700 kg/h
Installed dryer lines:	2
Operation time:	6500 h/a
Dry granulate production max.:	2.4 t DS/hr
Sludge throughput per dryer line:	10.3 t/h
Energy supply:	Nat. gas & heat rec. from gas engine
Thermal energy consumption:	0,9 kWhr/ kg water evaporated
Dewatered sludge dry substance content:	> 21%
Granulate dry substance content:	90 % DS
Granulate temperature:	<40 °C
Granulate size:	2-6 mm
Dryer exhaust stack emissions:	<3 mg/Nm ³ H ₂ S <20 mg/Nm ³ TOC <10 mg/Nm ³ Dust
Dried product pathogen content:	enhanced treated status