CASE STUDY

PROJECTAERATION FOR WASTE WATER
TREATMENT PLANTPRODUCTLow Speed AeratorsINDUSTRYMunicipalLOCATIONWestern Australia



BACKGROUND

In 2014-15 Water Corporation constructed Stage 1A of the East Rockingham (Waste Water Treatment Plant) WWTP, which included two (2) Oxidation Ditches (ODs). Each OD with approx. dimensions 115m L x 25m W x 6.1m D at (Top Water Level) TWL, was fitted with two (2) pier mounted surface aerators. Initially each OD would treat 3 ML/day increasing to 10 ML/day of screened & degritted sewage.

The system was designed so that in subsequent upgrade stages Primary Settling Tanks will be installed upstream of the ODs, that will allow future treatment of up to 20 ML/d per OD.

The NSA-series Low Speed Aerator model NSA5-300B (220 kW) supplied by DBS Manufacturing was selected for this project due to its low power usage and demonstrated performance in many similar applications

SOLUTION

DESIGN SPECIFICATIONS INCLUDE

- Average / Peak Standard Oxygen Transfer Rate (SOTR) per aerator of 410 / 472 kgO₂/h respectively
- Turn-down ability to 140 kgO₂/h per aerator
- Aerator motor power limited to 220 kW
- Aerator rotor tip speed not to exceed 5.5 m/s

DESIGN FEATURES

- NSA aerators use a planetary gearbox to drive the aerator rotor. This type of gearbox is commonly used in applications where power/cost ratio is important.
- NSA5-300B aerator can provide mixing down to a depth of 6.5m without the need for a draft tube, baffles, or any other device.
- For this project, each aerator is fixed onto a Mounting Platform that fits into a recessed hole in the concrete structure of the OD. When maintenance to the rotor is required, the entire aerator and mounting platform is lifted out, and placed onto a working platform located adjacent to the OD.

BENEFITS

- Efficiency. With Standard Aeration Efficiency (SAE) of 2.0 kgO₂/kWh the NSA5-300B aerator offers exceptionally high efficiency, and turn-down capability, resulting is low power costs.
- Low Maintenance. Aerator design allows for simple and low-cost maintenance.



Schematic of NSA5-300B aerator fixed to Mounting Platform, as installed at East Rockingham WWTP



East Rockingham WWTP - Each oxidation ditch has two (2) NSA5-300B aerators installed

