

Proposal

to

SWS Ltd

for a

Treatment Plant

for

Condensate

arising

from

Sludge Drying Operations

by

BRIGHTWATER
ENGINEERING

process engineering with total contract capability

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Part of the **BORD NA MÓNA**  Group of Companies
BORD NA MÓNA ENVIRONMENTAL LIMITED

3 Outline Process Description

Our supply will commence at the inlet to the pumping station receiving condensate liquors from the dryer plant (by others).

Inlet Mixing/Pumping Station

To provide process protection a 3mm 2 dimension stainless steel basket shall be used to screen the influent as it enters the pump sump.

Influent to the plant shall be measured for pH and temperature in the sump. pH shall be managed by addition of 10% sodium hydroxide (NaOH) to be dosed using a single metering pump drawing directly from canisters or IBC containers (by others) stored in dry, heated building (building by others) located adjacent to the treatment plant. The purpose of the sodium hydroxide dosing will be to achieve a pH >6.8. A bund stand is provided to provide safe storage for the sodium hydroxide container.

A source of ammonia (e.g. urea) shall be dosed proportionately to the feed flow using a single metering pump drawing directly from canisters or IBC containers (by others) stored in dry, heated building (building by others) located adjacent to the treatment plant. Dosing will be to the mixing sump at a rate set during commissioning. A Nitrogen source is required as proposed levels are below the levels required for healthy treatment and sustained bacterial growth. Dosing will only occur while the feed pump is running.

The single condensate treatment plant feed pump, submersible type, shall operate on sump levels, with low level protection. The mixer, propeller type, will operate continuously.

A bypass pipeline is provided to enable the anoxic zone, or both anoxic and FBDA (fine bubble diffused aeration) to be bypassed in the future. Manual valves on this line shall be normally closed. The valve on the feed to the anoxic zone shall be normally open.

Anoxic Zone

Flows from the inlet pumping station shall be pumped to the anoxic zone. Return activated sludge shall return to the head of the anoxic zone. Both flows will be discharged below water level to reduce air entrainment.. To promote anoxic conditions non load bearing baffles shall be used for plug flow. A submersible mixer shall provide mixing within the first leg of the anoxic zone. Exit from the anoxic zone shall be through a cut out below water level to the fine bubble diffused aeration plant.

Fine Bubble Diffused Aeration Plant.(FBDA)

Flows from the Anoxic zone shall gravitate to the FBDA. Aeration is provided by fine bubble diffusers. The tank shall be configured by the use of baffles to provide plug flow conditions. This optimises treatment performance.

MBR

Flows from the FBDA shall gravitate to the MBR tank. There will be up to 4 membrane modules installed in the unit. A single recirculation pump shall be installed at the maximum distance from the inlet to return sludge to the head of the anoxic zone. This pump shall operate continuously.

Air for both FBDA and the MBR shall be provided by duty standby blowers. Total air requirement is 727 m³/hr. The split between the two systems will be controlled by orifice plates in the air lines.

Permeate from the MBR will be collected in a permeate sump.

Permeate Sump.

The permeate sump pump will operate only in prolonged periods of no flow. This will be linked to the operation of the inlet pump. If the inlet pump does not operate for 30 minutes, the permeate pump shall operate until the inlet pump operates again.

Flows from the permeate sump shall gravitate to discharge. Flows pumped from the permeate sump shall be returned to the head of the MBR.

Access

Access is required to all operational tanks and valves.

Odour control

This control philosophy does not envisage odour control of the aerobic treatment plant being necessary. However, the chemical analysis data sheets provided do indicate that acetone may be driven off during aeration, and may cause a nuisance odour. Should this be the case the off gases from the treatment plant will need to be connected into the odour control system. This has not been allowed for in the pricing for the plant at this stage.

Instrumentation

1. pH probe - inlet
2. Temperature probe inlet

Civil Works

We have not allowed for any civil works in connection with the plant..

4 Main Process Items

DETAIL	No OFF
INLET MIXING and PUMPING	
Basket type screen in Inlet to pumping/mixing tank	1
Inlet mixer - propeller type	1
Pumping / Mixing station with single submersible feed pump duty 2l/s	1
Non-return valve	1
Isolating butterfly valve 50mm	1
Local pipework from Pumping/mixing station to anoxic tank in steel/ABS	1
Lot bypass pipework around anoxic zone and FBDA	1
Anoxic zone isolating butterfly valve	1
FBDA isolating gate valve	1
MBR isolating gate valve	1
Caustic Soda Dosing	
IBC level sensor assembly	1
Caustic Soda dosing pump	1
Single IBC bund stand	1
Dosing pump pipework to dosing point	1
Insulation for dosing pump pipework	1
Urea Dosing	
IBC level sensor assembly	1
Urea dosing pump	1
Single IBC bund stand	1
Dosing pump pipework to dosing point	1
Insulation for dosing pump pipework	1
Anoxic Zone	
Mixer - propeller type slow speed	1
Anoxic / FBDA Tank	
Combined Anoxic and FBDA tank in steel	1
Set of internal baffles for anoxic/FBDA tank	1
Fine bubble diffusers	35
Tank floor-gear	1
Connecting pipework to MBR tank	1

DETAIL	No OFF
BLOWERS	
Fixed Speed Blowers & acoustic enclosures.	2
Pressure switch	2
Temperature switch	1
Air main air supply pipework to FBDA and MBR tanks pipework & valves 100 mm 25 m plus 4 90deg elbows, 4 butterfly valves	1
MBR Tank	
4 module MBR system including	1
<ul style="list-style-type: none"> • Tank in steel • 4 x 50 module plate packs each containing 100m2 (nominal) membrane area • Permeate pipework with quick release couplings • Air release pipework with quick release couplings • Permeate recycle pipework within tank • Module air isolator • Air non-return • Level probes • Level sensor • Flow meter 	
Sludge Return Pump - open impeller type	1
Sludge return pipework back to anoxic zone	1
FINAL Permeate Pumping	
Set Permeate recycle pipework	1
Pumping station with single submersible pump for permeate recirculation in low flow conditions	1
Local pipework	1
Non-return valve	1
Isolating butterfly valve	1
INSTRUMENTS	
Set Instruments as required	1
VALVES	
Lot Valves as required (as outlined above)	1
POWER & CONTROL CABLING	
Power and Control Cabling as required	1
CONTROL PANEL	
Control Panel to IP55 Form 2 housing all contactors, overloads controls etc. to be located in existing enclosure. (exact design standards to be confirmed in discussions post	1

DETAIL

No OFF

this offer)

PLC to control function and alarm systems within the plant

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Please note telemetry is not allowed for at this stage but can be included if required. We also assume the control panel will be located within your existing building and no kiosk will be required.

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