

## Daldowie Sludge Liquor Treatment Plant



### Plant Description:

- Membrane Bioreactor Plant to treat liquors from the sludge treatment facility for Daldowie, Glasgow
- Treat centrifuge liquors and condensate from 6 thermal drying plants
- Discharge into the River Clyde

|                           |   |
|---------------------------|---|
| <b>Current Status:</b>    | Works in progress, commissioning Autumn 2001  |
| <b>Client:</b>            | Scottish Power  |
| <b>Contract award:</b>    | May 2000  |
| <b>Consent:</b>           | 20:30:8 BOD:SS:Ammonia  |
| <b>Performance:</b>       | 5:5:5 BOD:SS:Ammonia  |
| <b>Brief Description:</b> | Design and supply of Membrane units, plus technical support during installation and commissioning up to take-over |

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### Process Description:

MBR Technology has been awarded a significant contract by the Scottish Power, Millar, Wabag PFI Consortia (SMW) for the West of Scotland Water Authority.

SMW has elected to provide a liquor treatment process that comprises:

- Lamella settlement
- Membrane Aeration Tanks
- Outfall to the Clyde

The membrane bioreactor system has a number of benefits compared to conventional activated sludge processes, these include:

- Small plant footprint
- Better solids removal
- No settlement tanks required
- Disinfection
- Increase volumetric loading
- Greater de-coupling of hydraulic and biomass retention time
- Long sludge retention time allows the development of slow growing micro organisms such as nitrifying bacteria
- Greater retention of high molecular weight soluble compounds thus improving biodegradation

Flow from the lamellas passes to 4 biological membrane tanks. Each tank contains 32 membrane units and 1,378 diffusers.

The plant will treat effluent generated from 6 dewatering and dryer lanes, processing the design maximum dry solids load, with 1 membrane tank off line.

If the dewatering /dryer plant be run at the maximum capacity of 6 lanes the fourth membrane reactor may be brought online depending on the volume and concentration of liquid being treated.

The MLSS value has been calculated to run at a nominal maximum value of 20,000mg/l, for maximum flows. Each tank volume will nominally be 2,357m<sup>3</sup>. A sludge age of 20 to 24 days ensures proper nitrification.

Each pair of membrane aeration tanks is supplied by a duty/duty/standby arrangement of blowers. Each membrane tank has a dedicated blower providing air to the membrane unit with a separate blower arrangement to provide aeration to the fine bubble diffusers. The blowers for the membrane diffusers are nominally rated at 3,840 m<sup>3</sup>/hr@0.55bar.

### Plant Data

Aeration tank volume  
MLSS 12000-18000mg/l  
No. of membranes units 128xJ200  
Membrane Surface Area 20,480m<sup>2</sup>

### Design Data

Flow to Full Treatment:  
450m<sup>3</sup>/hr maximum flow rate  
366m<sup>3</sup>/hr average flow rate  
295m<sup>3</sup>/hr minimum flow rate  
537m<sup>3</sup>/hr maximum flow rate with six dryers running and no standby

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