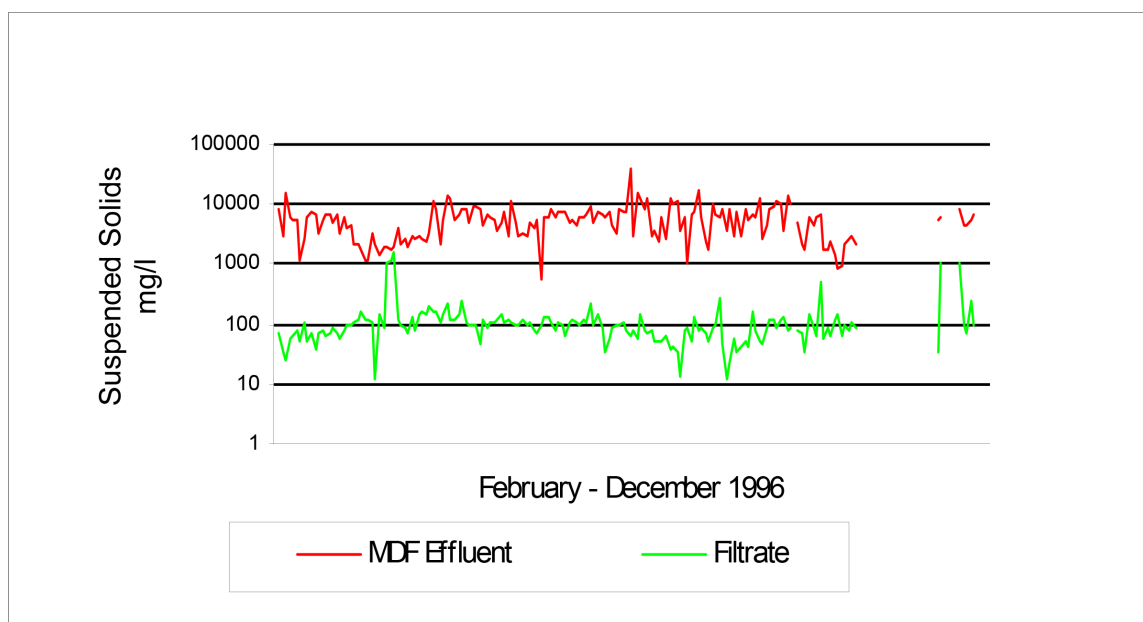


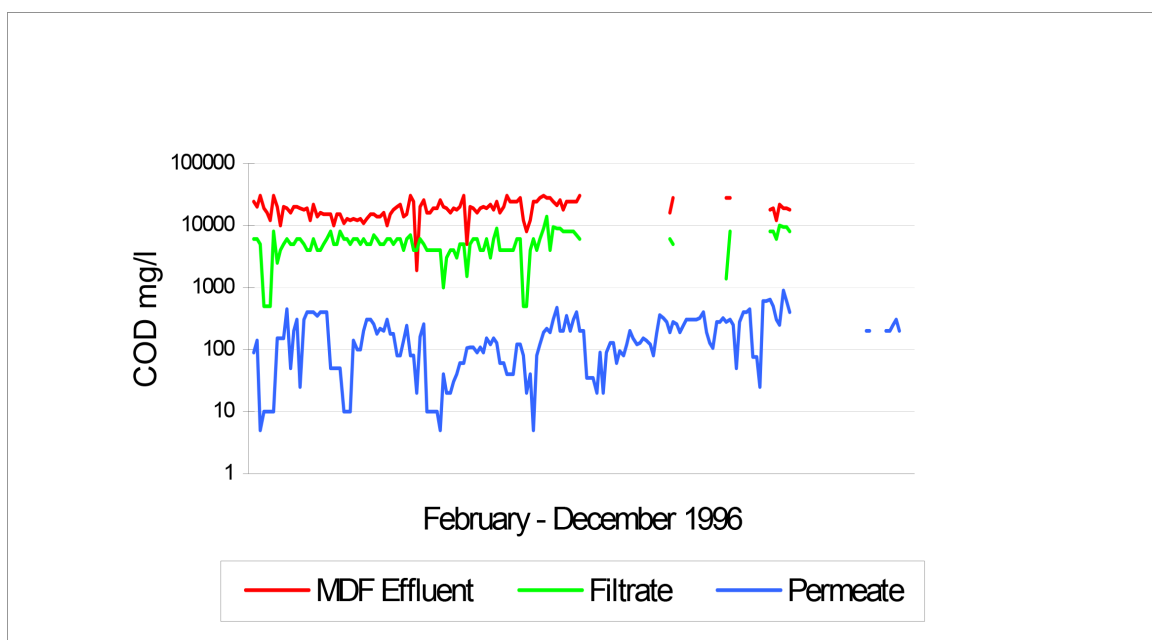
PANEL BOARD PULP & PAPER APPLICATION

«ZERO DISCHARGE» WOOD PULP EFFLUENT TREATMENT PLANT TREATABILITY RESULTS

MDF Treatment/Recovery Plant, Wales
Suspended Solids Effluent Quality



MDF Treatment/Recovery Plant, Wales
COD Effluent Quality



OUTPUT QUALITIES & RECOVERY OPTIONS

Output Qualities	
Output Source	Quality
Ex Dual Media	<25 mg/l SS
Ex Membrane Plant	<25 mg/l SS <150 mg/l COD
Concentrate	~ 4.6% TDS ~ 0.1% Volatile Solids ~ 75,000 mg/l COD ~ 20% Extractives ~ 13.5% Lignin
Ex Carbon Filter	<25 mg/l SS <150 mg/l COD <20 mg/l Hardness

Note: The output qualities presented above are based on a similar plant designed and operated by Esmil Process Systems. Output qualities will vary according to the source and species of raw timber, the MDF manufacturing process and the operation of the plant.

RECOVERY OPTIONS

The **Esmil Plant** will be designed to achieve 90 - 95% water recovery and will generate three generic outputs, all of which are recoverable. The process outputs from both pretreatment and the membrane plant are as follows:

Treated water (90 - 95%) may be recovered at various stages within the Esmil Plant and recycled to the manufacturing process

- **filtered water** leaving the multi-media filter may be of suitable quality for recycle as chip wash make-up water.
- **permeate leaving the membrane plant** may be of suitable quality for recycle for scrubber make-up water.
- **permeate leaving the activated carbon filter** (to further reduce COD) has a very low hardness and may be recycled to the existing boiler feed water ion exchange plant thereby releasing substantial savings on regeneration chemicals.

Concentrate (5 - 10%) may be either incinerated in the waste recovery boiler on site or re-used as resin make-up water. MDF manufacturers using concentrate as resin make-up water claim it enhances the board quality and lowers the requirement for synthetic resin.

NOTE the volatile solids only comprise 0.1% of sample indicating that concentrate is suitable for resin make-up water.

Filter cake with a high calorific value and a dry solids content of approximately 45%. The calorific value of the cake may be recovered by utilising it as boiler fuel.

Esmil Process Systems Limited

Unit 5 The Courtyard, Glory Park Avenue, Wooburn Green
High Wycombe HP10 0DG, United Kingdom

+44 (0) 1494 526 155 www.esmil.co.uk
info@esmil.co.uk