INLAND FACILITY	Energy & Greenhouse Gas Issues
Pre-treatment	Source Water Quality and Membrane Fouling

Summary of Issues | Strategies | Benefits & Costs | Key Uncertainties | Additional Resources

KEY POINT: *Energy use for pretreatment of brackish water depends on the quality of source water, and types of pretreatment processes.*

SUMMARY OF ISSUES

- Source water quality largely determines the extent of pretreatment and associated energy consumption.
- For some brackish groundwater, the energy consumption of pretreatment can be minimal if the feedwater requires only pH adjustment, addition of antiscalant, or simple 5 µm cartridge filtration, prior to the RO process.
- For surface water that requires extensive pretreatment, the energy consumption can be comparable to seawater RO pretreatment, that is, less than 0.2 kWh/kgal (0.05 kWh/m^3) energy requirement for gravity granular filtration pretreatment process; and 0.8-1.6 kWh/kgal (0.2 to 0.4 kWh/m^3) for MF/UF membrane pretreatment (Voutchkov 2008).

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STRATEGIES

Underground intakes, including wells or river bank filtration facilities, typically provide better quality in terms of solids, silt, oil & grease, natural organic contamination and pathogen content, compared to source water collected through open surface water (i.e., rivers and lakes) intakes. Use of underground intakes can therefore reduce pretreatment requirements and associated energy demand.

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BENEFITS & COSTS

Care should be taken to account for the trade-offs between capital and operating costs for different pretreatment systems (i.e. some pretreatment types may cost more in up front capital but can reduce operating costs and energy demand associated with the desalting and post-treatment processes) .

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ADDITIONAL RESOURCES

Voutchkov, N. 2008. *Pretreatment Technologies for Membrane Seawater Desalination*. Australian Water Association.

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