ABSTRACT

Many Aboriginal and other Remote Communities in Western and Northern Australia have drinking water which fails to meet acceptable health guidelines. These drinking water supplies are obtained from underground bores, many of which have high levels of salinity, nitrates and fluorides.

For many of these communities, the only options are to import water from other areas or move to another location, perhaps away from areas of cultural significance. A newer option is to use reverse osmosis desalination technology powered by alternative energy sources such as wind and solar power.

Before this technology can be widely used, many technical difficulties must be overcome. The major drawback of reverse osmosis systems is the decline of fresh water output with time. This is caused by fouling of the reverse osmosis membranes.

This thesis examines various methods to reduce fouling of a Reverse Osmosis desalination system driven by a standard farm windmill and bore pump. The emphasis is placed on careful design and astute use of construction materials. The modelling of the windmill to various site conditions is examined.

A Windpowered Reverse Osmosis Prototype was designed, built and field tested to assess the utility of the technology for remote areas.