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**The Valuation of South Australian Wetlands and Their
Water Filtering Function:**

A Cost Benefit Analysis

A thesis submitted by

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ABSTRACT

The Lower Murray dairy swamps were once part of a series of freshwater wetlands stretching along the Murray to the Coorong. Of the original 5700 hectares of wetlands only 500 hectares remain today. While the dairy industry that has developed on the swamps has considerable commercial value, it has destroyed the natural water filtration function that the wetlands provided. The industry also causes high levels of dairy effluent to enter the River Murray, contributing to blue-green algae outbreaks and associated economic losses for the local tourism industry.

This thesis provides valuable cost–benefit results on a set of three mutually exclusive land use and management options for dealing with the joint problems of water filtration and blue-green algae. The most important options examined involve the return of this area to wetlands for water filtration rather than continuing to use it for dairy farming.

The use of wetlands for water filtration significantly reduces the cost of supplying filtered water to consumers and also solves the dairy effluent problem. Indeed, one of the main conclusions of this thesis is that the most economically valuable use of this land is for wetlands for water filtration (rather than, for example, for dairy farming) and that the valuation of wetlands should be based on this use.

Little work has been undertaken in Australia to value the water filtration service that wetlands provide. In part this is due to poor data, considerable filtration variability between and across wetlands complexes and a focus on peoples 'willingness to pay' for selected wetlands attributes. This thesis contributes to the literature on wetland valuation by determining a value for the water filtration service they provide. It proposes a valuation methodology that can be used for both constructed and natural wetland complexes and which allows for variation both in water filtration efficiency across wetlands and in the amount of time that temporal wetlands are attached to the river.

The thesis is also of practical policy significance, providing sound arguments and empirical analyses to show that (i) there is a very strong prima facie case for retaining and restoring wetlands for their most valuable water filtration service alone, and (ii) that the valuation of wetlands in Australia solely on the basis of people's 'willingness-to-pay', i.e., ignoring their water filtering function, greatly underestimates the overall values and benefits of wetlands to society. The adoption of a 'function' or 'service' based valuation system would facilitate the introduction of a wetland mitigation banking system in Australia.

The results of this thesis will assist governments in Australia and elsewhere, when they deal with water filtration/quality problems, to make economically efficient and environmentally sound choices in their attempt to maximize the community's welfare.