ECS - Evaporation Control Systems

Submission to the Legislative Council of the State of Victoria regarding Melbourne's Future Water Supply

We submit *E-VapCap®*, a product and system that could supplement Melbourne's water supply by reducing evaporation losses from existing water storages.

Compared to other water harvesting systems:

- *E-VapCap®* presents a minimal capital outlay
- *E-VapCap®* has virtually no ongoing operating costs
- *E-VapCap®* produces extra water with virtually no carbon emissions

Synopsis

Melbourne has one of the best rainfall harvesting and storage systems in the world—perhaps the best for a city of its size. Unfortunately, the natural yield into its storages appears to have reached maximum potential.

Substantial loss of this high-quality water occurs due to evaporation. If all of Melbourne's storages were full, this loss would amount to approximately 84 000 ML each year, enough to meet the annual needs of 1.3 million people (assuming ussage of 170 litres per person per day).

This loss is expected to increase as climate change leads to reduced rainfall and higher average temperatures.

About Us

Evaporation Control Systems (ECS) is a small, innovative company based in Queensland. Over the past 20 years we have developed *E-VapCap®*, a cost-effective and safe system of evaporation control.

ECS holds three Australian patents covering the design and installation of *E-VapCap®* covers.

We operate as part of a corporate alliance consisting of five Australian companies:

- ECS: Licencee of the patented technology
- Sealed Air Australia: Material manufacturer based in Sydney and a subsidiary of Sealed Air Corporation, a large US company with a global commercial presence
- Darling Downs Tarpaulins: A Queensland-based licensed installer of *E-VapCap®* responsible for 80 installations
- Bartlett's of Ballarat: A Victoria-based licensed installer of *E-VapCap®*
- Ertech: A Perth-based licensed installer of *E-VapCap®* and a significant engineering enterprise

E-VapCap® covers have already been installed on 100 sites around Australia.

Our Product

E-VapCap® covers consist of heavy duty, virgin-grade polyethylene sheets. Each sheet has three layers—the top white and the lower two black—and is extruded to contain buoyancy cells. The total gauge of the material is 850um, and it is heavily UV stabilised. This material is manufactured and patented by Sealed Air Australia.

Efficacy

While we conservatively claim that *E-VapCap®* reduces evaporative water loss from the covered area by 95%, independent university tests have shown savings of up to 100%.

Installation

While three styles of installation are available, our patented modular system is specifically designed for large storages such as urban potable water supplies. This system consists of an array of independent modules, each with a nominal area of 5,000m^2.

The modules in each array are surrounded by and positioned within a framework of stainless-steel cables that fixes the modules in position relative to each other and to the perimeter of the storage. Module attachment is at the corners and mid-way along the long axis to avoid 'point loading'. This form of attachment and positioning also prevents wind frictional forces from being transferred between modules.

Multiple design elements are in place to prevent wind intrusion under the cover. Where the fetch of open water is extensive, wave baffles may also be installed outside the perimeter of the arrays.

While each module is nominally 100m x 50m, variations are permitted to allow a 'best fit' design of the array to suit the particular shape of the storage.

The number of modules per array, and arrays per storage depends on:

- The client's target of water saving; and
- The specific characterisitics of the storage area.

Each modular array is custom designed by Rod Bligh of Bligh Tanner Pty Ltd, Civil Environmental & Structural Engineers in consultation with ECS's Warwick Hill. All designs incorporate the results of detailed wind tunnel research conducted by BlighTanner.

Effect on Water Quality

Beneficial effects of *E-VapCap®* on water quality include:

- Reduced turbidity (due to its dampening effect on wave action)
- Suppression of algal growth
- Reduced concentration of dissolved salts
- Reduced bank erosion

Modular installation of *E-VapCap®* allows for significant areas of exposed water, both around the perimeter of the array and between individual modules, allowing maintenance of dissolved oxygen in the water.

Water Level Variations

In completely emptied storages, *E-VapCap®* modules will rest securely on the bed of the storage and refloat when water is reintroduced.

E-VapCap® installations have 12 in-built protective features to ensure they present no risk to dam infrastructure if the storage floods. Risks from extreme currents, wave formation and water-borne debris have also been controlled through design.

Warranty

Based on independent NATA lab tests of a thinner prototype material, we offer a conditional warranty period of 10 years with an expected cover life of more than 20 years.

Comparison to Other Technologies

Compared to *E-VapCap®* , other water harvesting solutions:

- Have a much higher capital cost per megalitre of water produced
- Incur large operating costs
- Incur huge carbon costs

By contrast, saving water with *E-VapCap®*

- Presents a minimal capital outlay
- Involves virtually no ongoing operating costs
- Incurs virtually no carbon cost and delivers water into existing storages using a recyclable material that is also a carbon sink

Further Information

While most of our design and engineering details are confidential, we would welcome the opportunity to present all aspects of our product to an interested authority under strict conditions of confidentiality. We confidently claim that any questions or issues regarding *E-VapCap®* can be satisfactorally dealt with.

While we understand that evaporation reduction may not provide the sole solution to Melbourne's future water security, we believe it should be seriously considered as a significant contributor.

Warwick Hill

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