

# The Tamar: A clean/green silt free waterway protected against a 200 year flood event and sea level rise. Is it achievable?

## Introduction

Over the last 4 years, Tamar Lake Inc and the responsible management Authorities (Launceston Flood Authority, NRM North and TasWater) have made giant strides in understanding what we need to do to achieve this goal, and have identified the probable costs and economic benefits that could be realised from this achievement.

The Launceston Flood Authority has just completed the development of the flood levee system around the low lying areas of Launceston to protect against a 200 year ARI flood event under a current tidal and future sea level rise scenarios.

TasWater has developed a strategy for the Launceston Sewage Improvement Project with the tertiary treatment of all discharges into the Tamar, and are developing a plan for implementation in the 5 to 10 year time frame.

NRM North through their TEER Water Quality Improvement Plan are developing an understanding of the locations of the diffuse and point sources of sediment, nutrients and bacteria from the Tamar catchment areas with a view to reducing the pollution effects flowing into the Upper Reaches of the Tamar.

## Tamar Lake Inc Contribution

Formed 4 years ago to initially examine the feasibility of installing a barrage in the Tamar to solve the silt accumulation problem in the Upper Reaches, the member funded Incorporated Association and their consultants, have to date carried out 8 studies into the technical, environmental and economic viability of the Tamar Lake concept with the following results:

### *Barrage siting and construction cost*

Located in Long Reach, just south of the Port of Bell Bay, the 800 metre long barrage will have flood gates sufficient to pass 200 year flood events without any negative upstream effects in Launceston; ship locks that will accommodate the passage of large commercial vessels as well as leisure craft; and fish ladders that allow the passage of fish species needing to transit the barrage for life cycle purposes.

The barrage will also provide bicycle and pedestrian passage from Rowella to the East Tamar Highway.



Projected to start in 2019 with a 3 year construction period, the capital cost is estimated at \$320m.

### *Flood studies*

The Tamar Lake flood studies have shown that with a maximum of 24 hours warning of a flood event, the lake level may be lowered to provide enough buffer storage upstream to mitigate all flood events up to a 200 year event for both current and sea level rise scenarios.

The removal of any tidal effects upstream also contributes to the effectiveness of this system, and also allows for the effect of low to moderate flood events (5 to 50 year) to be managed to not top the banks at the Boardwalk, Royal Park flats, and Glebe flats etc.

### *Sedimentation*

The Tamar Lake sedimentation strategy is to move the flocculation zone from the current Tamar Island to Freshwater Point area as close as possible to Bass Strait, and to remove the upstream tidal pumping action in the Upper Reaches.

Initial studies have indicated that with this strategy there would be little or no silt deposition in the freshwater lake section, or in the tidal estuary downstream of the barrage.

The 3 D hydrodynamic model currently under development is expected to enable quantification of these effects.

### *Water quality and turbidity*

Provided TasWater and NRM North water quality programs are successfully completed in the 10 year time frame, a water quality of B+ in Tamar Lake should be achievable once the flushing of the lake has been carried out.

This also applies to the turbidity of the water in the lake. With no flocculation in the freshwater, there is no reason why the turbidity should not be as clear as the sample taken from Lake Tevallyn shown in the right hand jar in the photo below. The left hand jar is a sample from Royal Park.



### *Environmental impact assessments*

The environmental assessments show that while there will be some displacement of natural ecological values, no listed species will be threatened and the freshwater habitats (including Tamar Island Wetlands) will be greatly expanded. This expansion may also benefit the introduced pest fish *Gambusia*. It is Tamar Lake's position that all attempts should be made to eradicate the *Gambusia* prior to implementation of the barrage.

The only species to die off will be the imported rice grass.

### *Marine Navigation*

With the lake level set at about 0.3m below the current high tide, studies show that vessels with a draft of up to 5 metres may transit in the channels from Bass trait to Launceston Seaport 24 hours per day.

### *Sea level rise protection*

The Tamar Barrage will be constructed to provide protection for the whole of the Tamar Valley upstream of the barrage for a predicted sea level rise of 0.8m.

### *Freshwater supply*

Following a period of flushing after the barrage has been completed, the volume of freshwater storage behind the barrage will be 405 GL or 80% the size of Sydney Harbour.

With annual inflows of between 1500 and 3000 GL, the lake will be flushed 3 to 6 times per annum.

Thus Tamar Lake will become a major natural freshwater asset, opening up potential applications in agriculture, aquaculture, and process industries, while presenting clean/green silt free environment for tourists and residents.

### *Economic*

The economic studies carried out to date have focussed just on Tasmania's areas of natural competitive advantage, agriculture and tourism, with a forecast total economic value add of \$553m, or a onetime economic impact of 2.3% of GSP, for a capital investment of \$320m.

A study carried out for Tamar Lake by KPMG using the Tasmanian non-linear economic model predicted the following impacts in these two segments.

#### **Assumptions**

- Barrage construction starts 2019, and takes 3 years for completion
- The economic impact is forecast for the 15 years post operation of the barrage
- Developed area under irrigation – 1500 hectares out of possible 15,000 irrigable hectares.

#### **Impact – construction phase**

- \$313m net additions to state GSP
- 856 jobs

#### **Operating phase – irrigated agriculture**

- \$10.3m per annum rising to \$20m
- 67 jobs rising to 128 jobs

#### **Operating phase – tourism**

- \$112m per annum in net GSP
- 716 jobs

In the 15 years, irrigation in the Tamar could produce:

- A doubling of the current area of vineyards
- A significant expansion of the area of apple and pear orchards
- A major increase in cherry farms and berry fruit

It is expected that the availability of an almost unlimited volume of freshwater in close proximity to the industrial zone at Bell Bay could stimulate a new era of industrial development in this zone.

## Where to from here?

Tamar Lake's plans for the next 12 months include:

- In conjunction with the LFA, NRM North, and TasWater, and with state and federal funding of \$140,000, a project has been commissioned for the development of a 3 D hydrodynamic model of the Tamar, with Tamar Lake intending to apply this model to 7 Tamar Lake scenarios to verify and understand environmental and technical aspects of the project that could not be carried out with the existing 2 D model.  
This is expected to be completed by the end of June, 2015
- In conjunction with the Launceston based federal Major Projects Approvals Agency (MPAA) and the state Office of Coordinator General (OCG), a project plan for the state and federal legislative approvals process has been prepared.  
This approvals process is expected to get under way in the second half of 2015.
- Continuing to build community awareness and support through public presentations, social media, and the Tamar Lake web site.
- Commission two new studies to:
  - Identify probable new tourism products made possible by the implementation of the Tamar Lake project and quantify the impact on the state economy over the 15 years post implementation
  - Identify and quantify new industrial development opportunities with a focus on the Bell Bay industrial zone.

## Follow-up

If any Member wishes to understand in more detail the issues covered in this article, please go to the Tamar Lake website at [www.tamarlake.com.au](http://www.tamarlake.com.au).

Robin Frith – 29<sup>th</sup> January, 2015

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