

# Launceston Flood Authority

## Annual Report 2019

Report for the period ending 30 June 2019



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# 1 CURRENT WORK

## 1.1 Taroona Street Flood Gate

Currently, work is underway to change the Taroona Street (Riverbend Park entrance) Floodgate from a sliding gate to a bauer gate. This will allow for a larger opening and be more accommodating for the increased use in the area once Riverbend Park is opened.

# 2 COMPLETED WORKS

## 2.1 Invermay Levee Stabilisation Works

North Esk River stabilisation works with steel piling and tie rods anchoring north of Black Bridge were successfully completed by December 2018. This was followed with reinstatement with reinforced concrete slabs and grass seeding. Movement monitoring is ongoing.



Figure 1. Invermay Levee Stabilisation with steel piling and tie rods, October 2018

## 2.2 Newstead Levee Construction Completion

Final completion of the new Newstead Levee was achieved in July 2019. Figure 2 below shows test installation of the new floodgate in Hart Street which forms part of the flood protection system.



Figure 2. Newstead Levee floodgate test installation, July 2019

## 3 INSPECTION, MONITORING AND REPORTING

### 3.1 Routine Inspection and Monitoring

The *Water Management Act 1999* (the Act) and the *Water Management (Safety of Dams) Regulations 2015* legislate high risk dams. Levees are linear dams; their risk category is based on the severity of damage and loss to communities situated in inundation areas they are protecting in the event of a dam-break scenario, as guided by the Australian National Committee on Large Dams (ANCOLD).

Under the Act, ongoing maintenance is a responsibility of the dam owner; our Dam Permit conditions require us to undertake safety surveillance on the levees. As such we conduct regular visual inspections and analyse survey monitoring data to check for movement and trends. We also test and operate tide flaps, penstocks and floodgates to make sure that the whole flood protection system performs when needed.



Figure 3. Photo of floodwall survey monitoring on Invermay Levee, August 2019

### 3.2 Mandatory Five Yearly Comprehensive Inspection and Reporting

Launceston Flood Protection System (the levees) falls within "significant or higher" Consequence Category. In addition to routine surveillance and maintenance activities, we are required to conduct comprehensive inspections, produce and submit a 5 Yearly Dam Safety Surveillance Report to the dam regulating authority at the Department of Primary Industries, Parks, Water and Environment (DPIPWE).

In October 2018, we carried out a mandatory comprehensive inspection in conjunction with dam safety engineers from consultants Pitt & Sherry. Post-inspection, the majority of identified defects have been completed while the remaining ones will be addressed in the oncoming dry weather months as outlined later in this report.

A draft version of the *5 Year Launceston Levee System Comprehensive Inspection Report* has been issued by Pitt & Sherry to the City of Launceston and is currently being reviewed by the dam owner. The approved report will then be submitted to the DPIPWE Dam Safety Department.

## 4 MAINTENANCE

### 4.1 Crack monitoring and repairs

The levees continue to be maintained to a high standard under our duty of care.

At the end of summer 2018, we filled shallow longitudinal cracks on the gravel footpath on Invermay Levee between Churchill Park and Heritage Forest, with sloppy bentonite slurry as recommended by Pitt & Sherry's geotechnical engineer as shown in Figure 4 below.



Figure 4. Photos of crack repairs with bentonite slurry Invermay Levee, March 2019

Shrinkage cracks usually appear during very hot and dry summer periods especially in areas with poor soils as in Invermay; we will increase surveillance in those areas and intervene when necessary. The medium to long-term plan is to add topsoil to identified sections so as to improve the quality of grass coverage. Where the settlement is in excess of 30cm we will find the cause and rectify by adding a clay layer before the topsoil and grass seeding.

We repaired some localised cracks in the Kings Wharf Levee opposite the North Esk Rowing Club by digging out and backfilling in layers with new clay before covering with topsoil and grass seeding. For details see Figure 5 below.



Figure 5. Photos of crack repairs and reinstatement on Kings Wharf Levee, April 2019

We also carried out repairs to improve grass coverage along bare sections of the earthen levees. Good grass coverage protects the levee from general wear and tear, as well as insulating the underlying clay material from drying out and shrinking in hot temperatures. A good sward of grass acts to protect the soil from eroding should overtopping occur during extreme flood events.

In autumn we added topsoil and trialed a new hardy grass variety on the Kings Wharf Levee between Goderich Street and Tarooma Street. This was in anticipation of the opening of the new Riverbend Park public facility and potential for increased wear and tear from high pedestrian traffic, that is likely to result in more frequent superficial maintenance on this section alongside Lindsay Street.

Figure 6 shows progressive work to improve grass coverage on the Kings Wharf Levee. We will continue with these improvements on all the levees within our affordable budget.



Figure 6. Photos of grass repairs on Kings Wharf Levee, March to July 2019

## 4.2 Vegetation Management on Levees

Unwanted and invasive vegetation hinders operational access and visual inspection of levee elements, as well as providing habitat for animal burrowing detrimental to an earthen levee. Decaying tree roots in the levee embankment can act as flood flow paths and a root ball from an overblown tree could initiate a potential breach in the levee. Last summer we removed unwanted trees from various locations on the levees. These were:

- Paterson Levee - difficulties with visual inspection of crib wall at Margaret Street Sewage Pump Station.
- East Launceston Levee near East Tamar Junction rail yard - trees hindered access, gate opening and promoted rabbit burrowing in earthen levee.
- City Levee - south-east side of Charles Street Bridge and Tamar Street Bridge, tree blow over risk mitigation.
- Kings Wharf Levee - sprayed blackberries in stone wall on landside batter, Kings Wharf Road.
- Invermay Levee near Churchill Park - removed self-setting gum trees from destabilising rock revetment in riverside batter.

Figure 7 shows before and after photos of some of the clearance of unwanted vegetation done on levees this year.

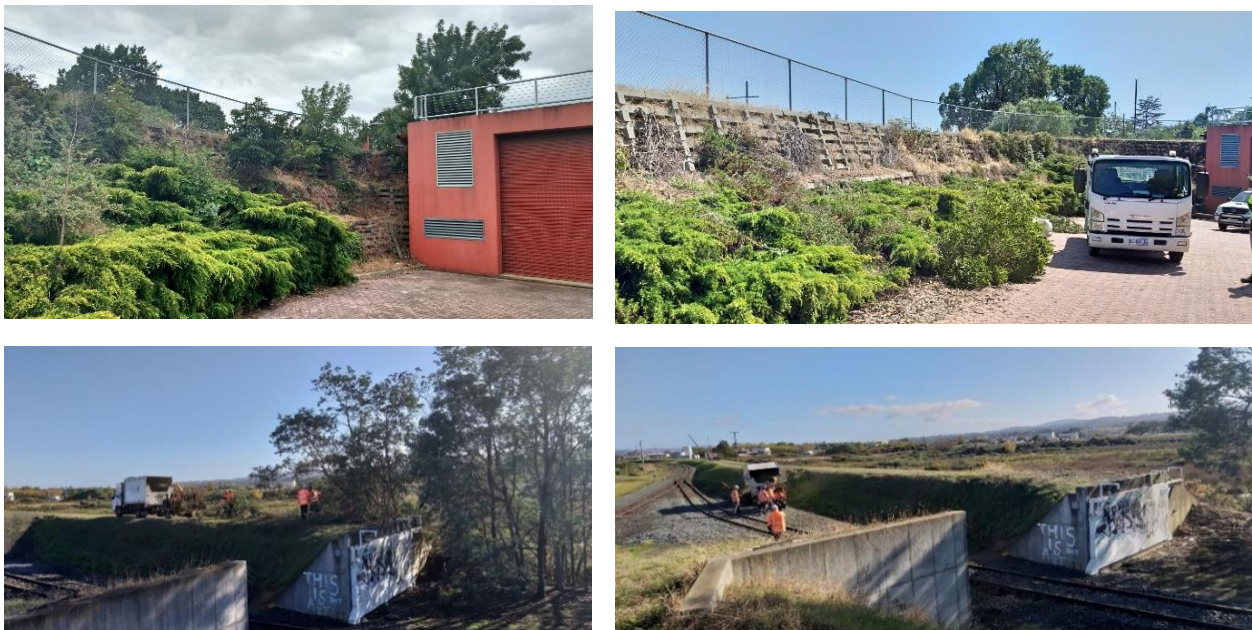


Figure 7. Photos of tree and bush clearing on levees, March and May 2019

## 4.3 Vandalism and Graffiti

Offences against property is a crime under the *Police Offences Act 1935*. Repairing damage caused by vandalism and graffiti costs public money and adversely impacts on our operational budget. City of Launceston crews were called out to rectify the following offences meted on the flood levees:

- Repair broken stainless steel cables on elevated public walkway behind QV Museum Inveresk on Invermay Levee (approximately \$2,000 annually),
- Cleanse graffiti on floodwalls and wingwalls on City, Invermay, East Launceston Levees and regatta side of Training Levee (approximately \$2,500 annually),
- Replace with steel panel demolished besser block walls on Training Levee in skate park (two panels replaced, \$2,000 per panel). This may continue as it is a popular gathering area for youths.

Figure 8 shows a vandalised wall at the back of the Training Levee.



Figure 8. Photos of vandalised besser block wall panel, May 2019

## 5 CURRENT WORKS

### 5.1 East Launceston Levee Floodgate Upgrades

Designs for upgrading the two floodgates across the railway lines (EG2 and EG3) by consultants Pitt & Sherry have been approved in-principle by engineers at TasRail. See Appendix A for location of gates.

Estimated construction and supervision costs are in the range \$550,000 to \$600,000. Considering the gates are currently functional, a decision has been made to defer upgrade works to a more appropriate time in the future.

### 5.2 Kings Wharf Levee Tarooma Street Floodgate Upgrade (Riverbend Park)

A new floodgate system has been manufactured and is currently stored at the Remount Depot in Mowbray; a permanent storage facility will be constructed at the time of installation expected in October 2019. There will be need to modify the existing levee during civil works, to accommodate a wider floodgate and access to Riverbend Park.

Figure 9 shows the current floodgate at the entrance to Riverbend Park, which is proposed to be widened and renewed with an alternative Bauer gate system.



Figure 9. Photos of existing Tarooma St sliding floodgate and new Bauer gate

### 5.3 Mowbray Levee Penstock Renewals

Three new penstock gates have been procured to replace the old ones at the western end of Hope Street and Mowbray Street. Details of new installation planned for summer 2019 (Figure 10) are as follows:

- Replace aging cast iron penstocks with new stainless steel penstock gate valves, below-ground.
- Replace rectangular concrete slab and heavy concrete-filled lids with lighter terra firma access covers incorporating safety cages to improve operational and public safety.
- Lower to ground level damaged raised manhole riser to facilitate safer access to below-ground penstocks.



Figure 10. Photo of planned renewal works on Mowbray Levee in summer 2019

## 6 SILT RAKING

Sediment mobilisation in the 2018/2019 financial year was undertaken in late winter/early summer (raking) and late autumn/early winter (prop washing).

A review of the program has recently been completed, in compliance with Condition 6 of the Grant of Authority issued by the Tasmanian Parks and Wildlife Service on 21 September 2018. The CoL/LFA formed a working group with members of NRM North's TEER Program to undertake the review of the data collected under the Sediment Raking Monitoring Plan. Dr Rebecca Kelly of NRM Pty Ltd was engaged to undertake the analysis of the water quality and bathymetry data.

Raking does mobilise benthic sediments but our recent work has proved that it does not result in mass movement out of the upper estuary. Sediment volume rose prior to the June 2016 flood event despite repeated raking campaigns. In the two years prior to the June 2016 flood, sediment volume again climbed with raking producing only very short-term falls in sediment volume. Sediment volumes were lowest several months after the June 2016 flood and persisted through the 2016/2017 summer months, coinciding with periods of high river inflow. The final bathymetry survey (June 2019) shows that sediment volume is again approaching pre-raking levels.

Sediment raking and prop washing has achieved short-term loss of mudflats on the West Tamar Shoal and at Seaport Marina however, this is not sustained, and raking without significant inflows leads to little effect on the levels of the shoals. Prop washing in Seaport Marina provides short-term improvements in navigational access to the marina, as it results in up to 2.5m of water at the berths at low tide; without prop washing, the marina rests on the mudflats at low tide. The final sediment management campaign for the financial year was to prop-wash Seaport Marina, taking 16 days to complete at a cost of \$68,672.40 (ex GST) to remove 3700m<sup>3</sup> from the marina (\$18.54/m<sup>3</sup>). This requires constant maintenance, and is a trade-off with navigation access at the North Esk River confluence, as sediment moved from Seaport creates a barway in the North Esk River and contributes to the confluence shoal.

The data shows that there is an increase in sediment volume in the channels. The confluence of the kanamaluka/Tamar River estuary and the North Esk River is the worst affected, with substantially more sediment in this section since the commencement of raking. The major flood event in June 2016 was insufficient to restore this to pre-raking depth. The loss of channel depth creates difficulty navigating the upper estuary below mid-low tide. The entrance to the North Esk River is now 1.5m shallower than it was in February 2009 when sediment volume was at its highest. Tamar River Cruises has reported numerous cruise cancellations due to an inability to leave their wharf, and tourists have been stranded when the boats ran aground in the channel.

Given the demonstrated ineffectiveness of the raking program coupled with environmental and commercial harm as a result of the program, the decision was taken to cease all raking and prop washing activities in June 2019. The prop washing program at Seaport Marina was at that point incomplete; the marina works were completed on 17 June 2019 and there has been no further raking or prop washing since that time.



GHD Pty Ltd have been engaged to investigate future sediment management options, with a focus initially on restoring navigation channels to the upper estuary and North Esk River and identifying longer-term options for this area. Raking has changed the previously relatively solid mudflats into a highly mobile and fluid sediment, allowing it to easily slump into excavated channels. It is recognised that restoration of navigation channels may prove challenging in the short term given the unconsolidated nature of the sediments in the Yacht Basin and is likely to involve a dredging program.

**Kathryn Pugh**

**Environmental Scientist**

# APPENDIX A - LEVEE LOCATION MAP WITH KEY STRUCTURES

