

Water Management Review

South Esk – Great Lake Catchment



Key Issues

- Water flow
- Water quality
- Aquatic environment
- Flood impacts
- Bank erosion

Related WMR Technical Studies

- Lake River
- Great Lake

Contact Details

For further information
please contact

Hydro Tasmania
Environmental Services

Telephone:
03 6230 5899

Facsimile:
03 6230 5933

Email:
environment@hydro.com.au

Mailing address:
GPO Box 355
Hobart Tasmania 7001



Technical Study – Downstream Poatina Assessment

The South Esk – Great Lake Water Management Review

The South Esk – Great Lake Water Management Review (SEGL WMR) examines Hydro Tasmania's water management practices in each of its catchments. The Downstream Poatina Assessment was initially proposed, along with 11 other studies, as part of the SEGL WMR, however, it was ultimately undertaken as part of Hydro Tasmania's Basslink assessments. The study was developed following extensive identification of aquatic environment and water management issues, involving consultation with stakeholders throughout the catchment. The issues identified are documented in two reports: *Environmental Review: Great Lake – South Esk Catchment* and *Community Consultation Report: Great Lake – South Esk Water Management Review*. The outcomes from the Poatina Basslink Investigations are documented in the *Summary Report: Basslink Integrated Impact Assessment Statement – Potential effects of changes to hydro power generation*. These outcomes, along with those from the 11 other technical studies will be incorporated into a Hydro Tasmania Aquatic Environment Management Program for the South Esk – Great Lake catchment.

Issues Investigated

The issues investigated during this study were related primarily to regulation of the flow regime downstream of the Poatina Power Station. The issues include bank erosion and associated problems, instream biota, flooding, public usage and water quality.

Background and Information Gaps

The Poatina Power Station generates electricity with water from the Great Lake. The station discharges water into Brumbys Creek in the South Esk catchment. Brumbys Creek is a tributary of the Macquarie River, which joins the South Esk River at Longford. These waterways flow through an agricultural region, and past two townships, Cressy and Longford. These waterways are also used for aquaculture, fishing, recreational boating and swimming.

Poatina Power Station operation, and its discharge, varies according to the season and hydrological conditions. Poatina is run more often in drier periods to utilise water stored in Great Lake, and so there is generally a more continuous discharge from the power station in summer. The discharge patterns vary according to the daily load requirement and water availability in other hydro-electric storages. During wetter periods, Poatina is typically run less often and is only turned on and off to meet additional load that cannot be met by the other stations in the system.

The fluctuations in water level resulting from Poatina operations have caused concerns for downstream landowners and other users. During the community consultation stage of the WMR, stakeholders raised concerns that these fluctuations contribute to flooding, bank erosion and damage water pumps, and impact on water quality, recreational use and the trout fishery. There was also a general perception that these fluctuations would be exacerbated by the introduction of Basslink.

While it was evident that the operation of Poatina was having an impact on erosion in Brumbys Creek, the extent of the power station's influence, and the relative impacts of power station operations and land use practices on the river system were poorly understood. Predictive hydrological modelling showed that Poatina Power Station operations were likely to undergo a change with the introduction of Basslink, and as a result, the flow regime downstream of Poatina would be affected.

Technical Studies

Aims

The aim of this study was to review issues that were identified under the Water Management Review process and investigate them in relation to the Basslink development. This work, done under the umbrella of the Basslink 'Integrated Impact Assessment Studies', determined appropriate management options in light of community-endorsed river management objectives.

Assessment of Issues

Assessments on the waterways downstream of Poatina were carried out to investigate potential impacts of the changed flow regime expected under the Basslink development. These investigations were comprehensive and dealt with issues raised through the SEGL WMR as well as the additional issues related to the Basslink development. The main findings in relation to the SEGL WMR are outlined below.

Discharge from the Poatina Power Station has influenced water quality in summer by reducing water temperatures, and causing significant dilution. In autumn and spring, higher water temperatures and a lack of through-flow result in reduced dissolved oxygen in the weir ponds in Brumbys Creek. There is also some evidence of dryland salinity on the banks of Brumbys Creek.

The pattern of discharge from Poatina Power Station, combined with domestic stock impacts and other adjacent land use practices, has caused significant alterations to the river channels in Brumbys Creek and the Macquarie River. Impacts include channel widening and braiding, siltation and colonisation by willows, removal of native vegetation and domination of cropping, pasture and weed species, and riverbank erosion.

While Brumbys Creek has a significantly different ecosystem compared to natural, the weir ponds support a healthy and productive trout fishery, with diverse (although modified) macro-invertebrate communities, as well as platypus and frog populations, and communities of the endemic freshwater mussel. The lower Macquarie and South Esk Rivers also have modified macrophyte populations but support popular recreational trout fisheries. The degree to which instream ecosystems are modified due to power station operations decreases with increasing distance downstream from Brumbys Creek.

Many of the stakeholder issues raised during the WMR consultation were from farmers who had site-specific concerns regarding the effects of the water level fluctuations on individual pump intakes and stock strandings. The Basslink social impact studies documented these concerns, and site-specific mitigation options to resolve these concerns were examined.

Under the Basslink development, Poatina Power Station is expected to operate more evenly on an annual basis, which will reduce the long-term flow variability. Despite the long-term reduction in discharge variability, short-term fluctuations are likely to increase, as the power station will be turned on and off more frequently. These hydrological changes could exacerbate many of the environmental issues raised through the SEGL consultation process, therefore it is expected that measures to mitigate the effects of Basslink will also address many existing environmental issues.

An operational review and modelling analysis of the current rules restricting Poatina Power Station operations during times of flooding was undertaken. The results showed that the current flood rules achieve their objective of minimising power station impacts on flood levels in the lower Macquarie River. The review suggested that an improvement in internal communications between local power scheme and operations staff during flood events should ensure that local conditions are more adequately considered during implementation of the flood rules.

Outcomes

As a consequence of the better understanding of environmental processes gained by these investigations, a riverine enhancement and environmental monitoring program has been proposed for Brumbys Creek below the Poatina tailrace.

A1.5 Mm³ re-regulation storage is proposed immediately adjacent to the end of the existing tailrace to act as an environmental control pond. Water will be diverted from the tailrace into this storage, rather than being directly released into the creek. A storage of this volume will hold approximately 10 hours of Poatina full gate discharge, and radial gates will allow control over the release rates into Brumbys Creek. This will provide more controlled release of Poatina water and will smooth out much of the daily flow fluctuations. This is currently considered to be the optimal mitigation option for concerns downstream of the Poatina Power Station under Basslink conditions. In addition to mitigating Basslink impacts, this option has the added advantage that it also addresses many of the existing environmental concerns and issues, since most of these are also linked to the variability in flow. The re-regulation storage will also address the issues relating to water quality, fluvial geomorphology, impacts on instream biota and socio-economic factors by reducing the fluctuations in water level downstream of Poatina Power Station.