

# UNDERSTANDING RIVER HEALTH OBLIGATIONS



*Paper Presented by :*

**Peter Field**

*Author:*

**Peter Field**, *Catchment and Land Coordinator*

Central Highlands Water



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**Peter Field**, *Catchment and Land Coordinator*, Central Highlands Water.

## ABSTRACT

This paper focuses the integration of River Health from parts 28 and 29 of Central Highlands Water (CHW) Statement of Obligations into the authority's Water Services Division.

An explanation is given of the obligations CHW carries in respect to River Health. This connects regional strategies developed by Catchment Management Authorities and the Department of Sustainability and Environment with the management of water authority assets.

Impacts arising from water authority service obligations pose future questions for water managers. Understanding these impacts through monitoring will assist decision making and will articulate constraints on water authorities given old assets, drought conditions and the environmental needs of waterways.

## 1.0 INTRODUCTION

The term River Health refers to the ecological health of streams and waterways and appears as an obligation within item 28 and 29 of the State Government's Statement of Obligations (SoO), as issued by the Minister for Water to Central Highlands Water (CHW) pursuant to section 41 of the Water Industry Act 1994.

This paper outlines the consultation and investigation undertaken by CHW in an effort to address its regulatory, social and environmental river health obligations. It provides a specific example of improvements to River Health.

It has taken a number of years for the Victorian River Health Strategy (2002), to tier down through regional strategies and into the development of the next water plan (2008-2013) for CHW. Early attempts at understanding of river health obligations were limited as there was little ownership held by staff and the limited development of regional river health strategies.

For CHW, the management of river health obligations across its sixteen supply systems is made complex because the corporation straddles five Catchment Management Authority (CMA) boundaries. Initial confusion of the principles CMA's use in planning for river health improvements has meant that CHW only commenced the development of a River Health program in 2006.

The identification of roles, accountabilities and systems for the delivery of River Health obligations has been developed through consultation with CMA's and the development of Department of Sustainability and Environment guidance documents.

CHW actively engaged the Corangamite, North- Central and Glenelg Hopkins CMA river health staff in order to understand their expectations of CHW in managing its impacts on river health in each region. This confirmed the principles and methods used by CMA's to set regional priorities.

It soon became obvious the major impact of CHW is the extraction of a significant percentage of natural flows from waterways for urban use. The main instruments to control these extractions are Bulk Entitlements (BE's). CHW has BE's for all its systems and obtaining these has been a major priority over the past few years. Typically these specify a maximum extraction (generally for one year) and also what is required for passing flows below the reservoir.

The recent Our Water Our Future strategic plans ( Ballarat Regional Action Plan and the Central Sustainable Water Strategy), whilst highlighting that improving river health is high on government priorities, it also indicates that there is no initiative for CHW to reduce extraction from waterways. The setting of the extraction volume and the passing flows is achieved through an extensive consultative process facilitated by DSE. These passing flows are a compromise between urban, environment and rural use.

As CHW is not reducing this impact it now seeks to participate in good faith in any discussion regarding optimisation of passing flows subject to any changes not impacting the yield of the system for urban use. However, because changing passing flows is not a trivial exercise given the potential conflict between the different users, any such change must be well planned.

Key learning's captured from CMA's was refined in consultation with DSE and this confirmed that CHW operations do significantly impact on river health. However the age of infrastructure and availability of capital finance is a major constraint to rapid changes to infrastructure for river health benefits.

In overview, CHW's river health impacts, as they align with the SoO, can be described as follows:

1. ***Extraction of flow.*** Diversion and storage of water in reservoirs and to meet urban requirements reduces the volume of stream flow. This tends to remove many minor flush or flood events and also alters the timing and scale of river flow events.
2. ***Structures*** such as dams and weirs present potential barriers to native fish migration. The effect of a particular barrier is dependent on the height and design of the barrier, frequency and timing of floods. Fortunately many of CHW's dams are located on ephemeral streams and are also often close to the top of the catchments thus reducing their impact. CHW is currently aerating a number of storages.
3. ***Reservoirs cause deterioration of natural water quality.*** Environmental flow releases downstream of a reservoir can change dissolved oxygen levels, temperature and sedimentation of waterway. River health monitoring plays an important role in managing this impact.
4. ***Discharges from wastewater treatment plants may result in*** an increase in nutrients which in turn may lead to algae growth in water ways. However, it is also important to recognise the environmental benefits of maintaining reliable flows into drought affected streams and rivers.
5. ***Riparian land and waterway management.*** CHW undertakes works to enhance stream flow and water quality by removing willow infestations and protecting riparian vegetation. This aims to maintain stream linkages, ecological diversity and processes.

## **2.0 DISCUSSION**

### **2.1 Restoring Waterways in the Upper West Moorabool**

In order to demonstrate the integration of River Health into CHW operations this paper now concentrates on riparian land and waterway management upstream of reservoirs and diversion weirs.

By far the most challenging CHW system with regard to River Health is Ballarat. The health of Ballarat source water tributaries and rapidly diminishing reservoir levels triggered stage four restrictions on the 1<sup>st</sup> of November 2006. As a result a number of new and alternative water sources projects were implemented. One of these, identified improvements to the oldest component of the supply system. The project was entitled “Ballarat Catchment Yield Enhancements”

At the same time DSE announced a Drought Employment Program to be implemented by CMA’s. These project’s alignment with the Corangamite CMA, brought six staff plus additional operational finance to the on ground works. Together the project definition outlined the potential benefits of willow removal and waterways restoration in increasing catchment yield and storage levels.

### **2.2 Waterway Enhancements Methodology:**

The primary outcome of the project was to increase streamflows into Wilsons, Beales and Moorabool Reservoirs and into the terminal White Swan Reservoir. Secondary outcomes included improved water quality, aquatic ecosystems, and net gains to biodiversity measured at a regional level by the CCMA. It aimed to improve stream flow, groundwater intrusions and surface flows over CHW land and into supply channels and through upper level reservoirs. This involved extensive willow control, channel forming, land drainage and culvert installation. It also aligned with the ongoing replacement of radiata pine plantations directly adjacent to waterways with a 30 metre buffer of native vegetation.

Water under the Upper West Moorabool Bulk Entitlement is collected through this network of reservoirs connected through open bluestone channels aged in excess of 100 years. During the early years of this supply system, significant supplementary drainage networks fed into waterways and reservoirs and was maintained by land management staff across the land estate. This drainage system deteriorated over numerous decades due to adequate supply levels, inappropriate road construction, plantation establishment, siltation and lost corporate knowledge.

The identification of these networks and the extremely dry conditions presented a unique window of opportunity to conduct on ground works. This provided a chance to accelerate waterway improvements and ensure quicker storages responses to increase rainfall in future years.

### **2.3 Willow removal**

Willows (*Salix sp*) is a declared Weed of National Significance. CHW has large and dense infestations of willows because heavy siltation of waterways has significantly altered the stream flow and channel width resulting in broad flat streams upon which

willow have proliferated.

Preliminary estimates using aerial photography equated over 50 hectares of willow within the study area.

This estimate is now considered low and inaccurate. Willow impact on CHW River Health obligations through;

- **Economic impacts** - willows are known to transpire large quantities of water (3 – 4 ML per hectare G.Peters pers comm.) during high temperatures and will full access to a stream or water body.
- **Social impact** – willows reduce water yield and constrict source water supply. These include natural groundwater discharge into springs and creeks, and reduced capacity of reservoirs.
- **Environmental impact** – willows change flow regimes and impact on erosion processes. They reduce the ecological health of streams and decreased water quality. Willows on CHW land provide continued source of weed distribution across the landscape.

A works on waterways permit was required from the CCMA in order to implement the project. The Water Act – 1989 (sections 160,161 and 219) gives the CCMA the authority to issue permits for works on waterways. A twelve month permit was issued on the 14<sup>th</sup> of November 2006. Specific permit conditions were applied to address risks to River Health as follows;

Willows are a significant environmental risk because of the extent of riparian land managed by CHW. The two main willow sub species present are Crack willow (*Salix fragilis*) Pussy willow (*Salix cinerea*). The risk of willows spreading is high as crack willow spreads by twigs or branches, and pussy willow spreading by seed. The control of willow is now a high priority land management action for CHW. Future land management actions will be focused on preventing the weeds reinfestation.

## **2.4 On-Stream Dam Management**

There are several on-stream storages above CHW Reservoirs on CHW land. CHW is working with leaseholders over the next eighteen months to progressively reduce demand on waterway extraction through a Surface Water Management Plan process. This will negate their reliance of on-stream storages above reservoirs. Once complete CHW will decommission and remove obsolete structures. Discussions with Southern Rural Water will also ensure summer passing flows occur through land not managed by CHW.

## **2.5 Reservoir Floor Channel Construction**

The construction of in-reservoir channels ensured the linkage of stream flow efficiently to the dam embankment. Channel excavation was conducted on the floors of Wilsons and Moorabool Reservoir. This has ensured the quickest and most efficient transfer of water through these broad and shallow reservoirs. Leading from each of the main reservoir tributaries the location of these channels will be listed as an asset requiring regular inspection.

## **2.6 Surface Water Flow Maintenance**

Significant surface water flow maintenance has been undertaken with flows being

drained into restored waterways and the bluestone channel.

This occurred as the development of forest harvest and haulage tracks in and around reservoirs inadvertently altered the flow of water through CHW reserves.

In some instance blocked culverts and drains had encouraged the spread of willow trees, in other cases water has inundated neighbouring agricultural land. New culverts have been also been installed on major tracks and waterway crossings. These have also reduced the impact of traffic on water quality.

## **2.7 Monitoring Works Impact**

In order to demonstrate a return on investment, future monitoring will include inflow and turbidity monitoring on three tributaries Wilsons Reservoir, and correlations between inflows and comparable rainfall years with storage levels will be drawn. Comparisons will then be made on the cost per mega litre between catchment improvements and alternative sources projects and demand reduction strategies. The Rapid Bioassessment Methodology for Rivers and Streams will also be used to gauge the improvement in aquatic biology.

## **3.0 CONCLUSION**

The removal of willow infestations, rejuvenation of waterways and the enhancement of remnant vegetation, requires ongoing site management to ensure sustained improvements. Inadequate ongoing maintenance will reduce stream access and hinder weed control efforts allowing the reinfestation of willow growth undoing recent achievements.

River Health is a major issue in Victoria today and CHW needs to be very specific in its understanding of its obligations to ensure that it does what it needs to do without becoming embroiled in unnecessary and expensive work.

The DSE 'Statement of Obligations' forms the basis of CHW's obligations. Discussion with DSE and CMAs has enabled CHW to develop an understanding of the river regulatory landscape and the needs and expectations of key stakeholders so that it can now make sensible and informed decisions.

A clearer understanding of River Health obligations has allowed CHW has to develop a second Water Plan program that begins to address the SoO. Significant progress has been made in relationships with Catchment Management Authorities and restoration of waterways in the Upper West Moorabool Catchment. Recent audit comments have acknowledged this improvement.

Central Highlands Water relies on the extraction of water from the natural environment to supply 16 systems. Although CHW has a large impact on river health through the diversion of water, it is mindful and proactive in minimising its impacts on the environment through improving waste water quality, better reservoir management, and the restoration of degraded waterways. Our River Health obligations relate to the operation of a sustainable business. They demonstrate the complexity of balancing human needs while meeting environmental needs.

#### **4.0 ACKNOWLEDGEMENTS**

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