Monbulk Creek: retrofitting energy dissipation techniques to improve waterway health in steep, existing urban catchments

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Biography:
Josh is an engineer with 2 years' experience. He is passionate about integrated water management and working with clients to achieve integrated water and landscape designs. Specifically, Josh has experience in urban stormwater management, analysis of stormwater hydrology and hydraulics, and stake holder management.

Most recently, Josh has been involved with the development of an integrated water management strategy for the Melbourne Airport.

Creeks and rivers which navigate their way through the urban landscape provide unparalleled economic, social, cultural and environmental significance to society. The health of these systems are unequivocally linked to the economy and overall amenity of our cities and towns. Alas, a number of grave challenges threaten the health of our waterways; namely urbanisation, pollution and climate change.

Recognizing the inevitable decline of waterway condition within the Port Phillip and Western Port region, Melbourne Water published an update to their Health Waterways Strategy (Oct 2018). This overarching planning document provides a 10 year program, which incorporates specific objectives for each of the five main catchments. Within this framework we (as water managers) are faced with a difficult question: How can we best target limited resources (both spatial and economical) within our catchments to achieve the best possible outcomes for the health of our waterways?

One of the creeks highlighted within the Healthy Waterways Strategy is Monbulk Creek, which flows from the Dandenong Ranges national park through Belgrave to Rowville. The catchment is characterised by both commercial and low density residential zones, extremely steep grades and high sediment due to unsealed roads and driveways. Existing drainage infrastructure tends to be installed at grade; in some locations at grades of up to 50% (1 in 2). This leads to very high velocities at outfalls, causing serious erosion and scouring.

The Yarra Ranges Council has conducted extensive mapping of the outfalls within the Monbulk Creek catchment with the objective of identifying sites in which to invest in WSUD design. This paper focuses on how retrofitting energy dissipation techniques at existing outlets throughout the catchment can provide significant reductions in outlet velocities, often at minimal costs and with no additional land take. Can this approach provide 'quick wins' for local governments as they seek to improve waterway health? Moreover does this approach provide the best 'bang for buck' when compared to building constructing and maintaining other WSUD treatment assets?