

GHD5207 Executive Summary

GHD was contracted to undertake works by the National Program for Sustainable Irrigation through the grant, 2nd Round 2008 National Program for Sustainable Irrigation, Western Australia and the South West Development Commission to undertake investigations into surface and groundwater interactions in the Wilyabrup and WarrenPemberton agricultural regions. The primary objective of this work was to further understand the nature of the surface and groundwater interactions in the Wilyabrup region, Margaret River and Smith Brook catchment, Manjimup. These catchments were selected as they are both reliant on reliable water supplies to sustain established agricultural and viticultural systems.

Based on a review of common methods used for investigating surface and groundwater interactions, GHD adopted a holistic approach to this investigation and used a combination of low cost methods to understand surface and groundwater interactions in two catchments in the south west of Western Australia. The approach considered a range of factors that have the potential to influence surface and groundwater interactions and provide a reasonable interpretation of the processes occurring at both a catchment and subcatchment scale.

Baseflow contribution to the Wilyabrup Brook was known to be minor based on field observations and communications with DoW staff. This was confirmed through a combined geomorphic and baseflow separation analysis by GHD which indicated that the Wilyabrup Brook is a surface water and interflow dominated system with minor baseflow influence driven largely by the prominence of duplex soils. Similarly, surface and groundwater interactions in the Smith Brook catchment were determined to be limited to the stream reach only. It was concluded the Smith Brook catchment is largely a surface and interflow dependent system, with minor baseflow contributions.

There appears to be good connectivity of surface water flows and some groundwater flows (interflow) to both the Wilyabrup and Smith Brook and that these connections should be managed to ensure their sustainability. Areas recharging both superficial and deep groundwater should also be carefully managed to ensure their connectivity to these systems is maintained. Areas most likely to recharge to these water systems are shallow and deep sands, located in the upper catchment reaches. Under The Rights in Water and Irrigation Act, 1914, both a surface and groundwater licence is required for some dams that receive inputs from surface water and underground water. In the case of both the Wilyabrup and Smith Brook catchments, baseflow contributions to streamflow are low. It is therefore fair to assume that underground water intercepted by some dams is likely to be interflow, not baseflow.

Given the strong linkages between surface water and interflow, it is a reasonable argument that surface water and groundwater be combined as one surface water license. There is also a strong argument to reconsider the definitions of surface water and underground water within the current act and whether these terms are applicable to all areas of the state, or whether specific acts are required regionally. In the case of the south west of Western Australia, the strong linkages between surface and groundwater make licensing difficult and in this case, combining these two water licenses into one may solve many water licensing issues. At the very least, it would streamline and simplify the licensing process and make interpretations by the public easier.