ACCURATE MODELING OF THE SYSTEM TRANSFER FUNCTION IS THE RIGHT ATTITUDE: USING AEM TO MAP CLAY THICKNESS AND EXTENT FOR GROUNDWATER RECHARGE DETERMINATION IS A CASE IN POINT!

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The pumping and disposal of saline groundwater from the margins of the River Murray in South Australia is an integral part of the State Government's salinity management strategy. It is specifically aimed at reducing ground water levels and salt accession to the River Murray. Along the margins of the Murray, large volumes of saline water are typically disposed of at the land surface, in what are referred to as "saline-disposal basins". Their long-term efficacy and the potential for developing others whilst minimising the groundwater recharge requires an understanding of the extent and thickness of near surface aquitards present in the region. These clay-rich units are known to have a significant influence on the rates of groundwater recharge in the study area, and their accurate definition is a necessary input into groundwater recharge models, which in turn determine salt flux to the Murray River system from planned and extant disposal basins in the area. We have used RESOLVE frequency domain helicopter electromagnetic data acquired over the Stockyard Plains saline-water disposal basins and environs located southwest of Waikerie, South Australia to demonstrate their value in regional groundwater management. We have also set out to demonstrate that constrained inversion with locally accurate 1D forward responses is critical to recovering accurate models from the AEM data. We have employed a constrained layered earth inversion to generate information on the depth, thickness and presence or absence of aquitards, specifically the Blanchetown Clay, and map variations in groundwater conductivity in the region. In this study we compare results before and after we take account of system attitude and altitude in the inversion to highlight the importance of accurate modelling.