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Numerical estimation of the future sustainable groundwater yield in the Kok River basin, northern Thailand

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Abstract Kok River basin in the Golden Triangle delta in northern Thailand is becoming a major international trade hub in the region. Going hand in hand with the expected future economic growth in this area will be adverse environmental stress on the water resources in the Kok River basin. Although groundwater in the region is still abundant now, there is increasing concern among Thai authorities that future over-pumping may deplete parts of the aquifers there. For that reason a groundwater sustainability study was initiated in order to quantify the future sustainable extraction rates for the various aquifers underlying the Kok River basin. Using a calibrated 3-D groundwater flow model sustainable extraction yields – defined as the maximal total pumping rate that ensures that piezometric heads in an aquifer do not fall below 20 m from the land surface in the next 20 years – have been determined for the four aquifers within the larger Kok River basin. The results indicate that there is still much room for near-future groundwater development in the study region.

Key words groundwater modelling; sustainable yield; Kok River basin, Thailand