

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1
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Comment on hess-2022-150

Anonymous Referee #1

Referee comment on "Technical note: Extending the SWAT model to transport chemicals through tile and groundwater flow" by Hendrik Rathjens et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-150-RC1>, 2022

General Comments

In their manuscript "Extending the SWAT model to transport chemicals through tile and groundwater flow" Rathjens et al. et al. describe the implementation of chemical transport for groundwater and tile drainage in the Soil and Water Assessment Tool (SWAT). This functionality can be of interest for researchers involved in transport modelling on landscape-level, for example, for academia, authorities, environmental agencies, water suppliers and other stakeholders. Therefore, the topic is appropriate for Hydrology and Earth System Science since this kind of research contributes to the understanding of hydrology and transport in the environment.

However, some points have to be considered before the manuscript can be published. Specifically, the calibration for the exemplary studies sites and how parameterization interacts with the modifications made have to be explained in more detail. This would add value to the justification of the modifications.

Therefore, minor revisions are suggested. Please find more detailed comments in the following paragraph.

Detailed Comments

Application (chapter 3; lines 171 ff): It would be desirable to get more detailed information on the calibration process and the selected parameters:

- Are both model parameterizations (with and without modification) similar for each test site? Please clarify.
- What are the parameters involved in the calibration? What is their impact on groundwater and drainage contribution to streamflow? Please indicate in more detail with specific focus on code updates made.
- A "multi-metric" calibration is mentioned. Besides visual inspection, was there any weighing used between streamflow and concentration metrics for calibration or, resp., a multi-objective calibration?