

## ***Interactive comment on “Predicting the salt water intrusion in the Shatt al Arab estuary using an analytical approach” by A. D. Abdullah et al.***

### **Anonymous Referee #2**

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The authors presented an interesting application of a 1D analytical salt water intrusion model on the SAR system. The novelty of the study situates in 2 aspects. First, new field data on the salt water intrusion problem on the SAR are collected, presented and analysed, which is as such already a good scientific achievement, knowing the problem of data collection in this difficult geopolitical environment. Second, the analytical model intrusion model was augmented with the predictive equation for the dispersion coefficient of Gisen et al (2015). This model combination shows acceptable performance, conditional to a good estimate of discharge data in the SAR system.

The manuscript is well presented, clearly written, concise and well formatted. Some small editorials are given in the annotated manuscript, but 2 points of concerns should still be addressed in a small minor revision.

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1. In some places in the manuscript, authors refer to personal communications and estimates that are made by local water authority on discharges in part of the SAR system (in particular the Karun tributary). The support for these estimates seems very poor. It would be appropriate to try to consolidate these statements, eventually by clarifying what quantitative information was used by local experts to make such assessments.

2. The authors focus on the impact of  $Q_f$  on  $D$  estimates in the combined approach. Yet,  $D$  is also affected by  $T$ ,  $E$ ,  $v$ . It would be good to perform a sensitivity analysis confirming that  $Q_f$  is indeed the driving factor in the  $D$  uncertainty. Also, the quality of the calibration is not very well presented. From Table 2, we can not infer the precision of the calibrated  $D$  values.

Please also note the supplement to this comment:

<http://www.hydrol-earth-syst-sci-discuss.net/hess-2016-141/hess-2016-141-RC2-supplement.pdf>

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