Response to Referee #2 comments:
Review of "Discharge of groundwater flow to the Potter Cove on King George Island, Antarctic Peninsula", by Falk and Silva-Busso (hess-2020-422)

Response to major (structural) points:

We thank the reviewer for the thorough evaluation of our manuscript and the helpful comments to it. The paper includes various complementary techniques to draw conclusions on the hydrological flow regime. We incorporated the comments in the text to emphasise the representativity of this local study to the wider region of the Antarctic Peninsula, and put it into clear context to global climate change. Thanks again for the comprehensive reading and advice.

1. Thank you very much for this major comment. We elaborated the context of our study results with respect to climate change. In especially, the more frequent melt periods observed by climatological and glaciological studies, indicate the basis for change processes of e.g. marine biota (highlighted by Braeckman et al, 2021) or ocean currents (e.g. Meredith et al. 2018). We included and elaborated at several points in the manuscript, following the very valuable and helpful comments of both referees.
2. Hydrogeological field studies are mostly local studies, in especially in this remote extreme area with very limited accessibility. We elaborated mainly in the discussion section the representativity of the local study to the wider region and its implications. We hope, this puts our main conclusions into a more general and to shows as well that, although a local study during a limited time period, the results are applicable to the wider Peninsula region and that due to ongoing climatic change, this study serves as a model for future scenarios of hydrological catchments along the rugged western coast of the Antarctic Peninsula.

Response to specific points:

P1, L10, ". . .2719.9 10-5. . .": Please use symbol "×" at here, also for the other places across the manuscript.

We agree. Thanks a lot for this comment.

P6, L17-18, "The groundwater hydraulic gradient...obtained from the piezometric map.": Please show more detail for how to get the groundwater hydraulic gradient.

The simplest way is to make the hydraulic load difference between two isocurves divided by the linear distance separating them. It should be ensured that the measurement is perpendicular to both curves. We use this shape because the basin is small. We rephrased to make this point clear.

P10, L3-4, "Based on the above. . .used here as input.": Please discuss uncertainties caused by using topographical gradients instead of hydraulic gradients in the model computation.

A proper uncertainty assessment is difficult to address in hydrogeological studies, that usually rely on scarce data and, in parts, on interpretation. We are not aware of any hydrogeology paper up to date, that includes this, especially not in studies in remote areas with very low accessibility. We included a paragraph on estimation of topographical and hydraulic gradients. The sensitivity analysis is meant to address the variability of results when varying the input. We changed this paragraph according to this comment and comments of Referee #1.

P10, L7, “criopeg”: cryopeg?

Cryopeg. Thanks! The manuscript was first written in Spanish, and there were few artefacts like this.

P13, L7-9, for equations (13) and (14): It is not clear that how the authors got the Qmax, Qmin, Rt,max and Rt,min, and how they transferred the range of Q and R to the uncertainty range of parameters.

The min-max values arise from several measurements at different locations, and reflect the variability of the observed quantity. They then translate into a min-max range of derived variables. We elaborated this in the text to make our approach more transparent.