

# ***Interactive comment on “Identifying the origin and geochemical evolution of groundwater using hydrochemistry and stable isotopes in Subei Lake Basin, Ordos energy base, Northwestern China” by F. Liu et al.***

## **Anonymous Referee #1**

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This study presents a very nice case study on chemical and isotopic features of groundwater in arid regions where groundwater is a major water source. The origin and the mechanism of the formation of groundwater chemistry are import to understand the groundwater circulation and to use the valuable resources sustainable. But the follow-  
ing concerns should be addressed before the publication. 1. In the 2.2, were data on the thickness of aquifers, the depth to water table and the hydraulic conductivities measured by this study? or they are from previous studies? If you cited, please add references. The Kuisheng lake should be removed as it forms an independent shallow

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system. 2ijŒThe discharge terms include the lateral outflow in the manuscript. Do you have any data to support your statement? As far as I know, the subei lake basin is in the regional discharge area. 3ijŒIn the Yin's study, the depth of 120 m was determined by the analysis of chemical and isotopic data, so I suggest you to do this as the two basins are located in the different hydrogeological units. 4ijŒThe temperature of lake water is below zero, please confirm the data. 5ijŒI suggest the first sentence of 4.2 should be moved to the introduction section. 6. The isotopes of deep cretaceous groundwater are enriched with respect to the shallow Quaternary groundwater and the isotopic values are very similar for groundwater from the Cretaceous aquifer. Please give more explain. I guess the reason is from improper classification of groundwater. 7. I suggest you combine section 4 and section 5 as in section 5 there are still results rather than discussion. 8. In the conclusion, you stated that the deep cretaceous groundwater is depleted in heavy isotopes that is conflict with the data. 9. More discussion should be added, particularly the comparison with the similar study in other places in the world. 10. English should be read by native speakers as I found many mistakes in the manuscript.

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