Response to 'Review', Anonymous Referee #1, 15 Jan 2010

We appreciate your comments and will revise the manuscript according to your suggestions. The comments are replied in detail by blue lines in the following paragraphs.

1. P.7615: Authors mentioned that "As shown in Fig. 2, flow rate of Heihe River at Yingluo Gorge is 10–220 m^3/s monthly and 11–23×10^8 m^3/a annually during 1989–2005". Related concepts are not professional. You can say "monthly streamflow", "annual streamflow" or "monthly runoff", "annual runoff", streamflow" and "runoff" are different concepts.

Accepted! It should be "monthly streamflow" and "annual streamflow".

2. Where the illustrations are located in the context? Suitable locations should be given by authors.

Accepted! We will revise the manuscript accordingly.

3. P.7617: K_L is not found in equation (1).

Sorry, it is a mistake in the manuscript during modification of the text again and again. "K_L is leakage coefficient" will be deleted in the revised manuscript.

4. P.7618: How to consider evaporation? If the simulation period is long, this amount should be great.

This point will be discussed in response of comment #6.

5. P.7619: What does the "flow introduced …"? Is it "return flow"?

It is not the "return flow". We will replace the sentence "the total flow introduced to" with "the total flow export to".

6. P.7619: Authors mentioned that "Evaporation over water table in the river is ignored because the total evaporation loss between site-1 and site-3 is less than 0.4% of stream flow at Yingluo Gorge". Where this conclusion comes from? According to the fact given in p.7616, the annual evaporation is greater than 2000 mm! It can never been neglected!

It is a good suggestion that the evaporation of river water should be accounted for. The maximum evaporation loss is calculated as 0.042×10^8 m^3/a, corresponding to length of the stream between site-1 and site-3 (30 km), maximum wide of the water table (70 m) and evaporation excess precipitation (2000 mm). It is about 0.38% of the

minimum annual streamflow at Yongluo Gorge (11.0×10^8 m³/a). So we concluded that the "total evaporation loss between site-1 and site-3 is less than 0.4% of stream flow at Yingluo Gorge".

7. P.7620: What does F0 mean?

F_0 is a reference leakage rate introduced herein to form a dimensionless power function in Eq.(12).

8. P.7621: Authors mentioned that "θs=0.25, θr=0.05, α=1.2m−1 and n=1.5 are applied in this study", and "Ks=10 m/d". Where these values come from? How to estimate these parameters? Reasons should be given in the context.

These parameters are specified according to normal empirical conditions of moderate sand soil as an approximation of the sediments under Heihe River. However, the exact parameter values are not available currently. It is not a serious problem because the model is built to analyze the general behaviors of leakage-recharge processing.

9. P.7622: Where Figures 5 and 6 are located? They are not mentioned in the manuscript.

Figure 5 has been mentioned in P.7619, line 9, and Figure 6 has been mentioned in P.7619, line 23.

10. P.7630: In the verification of the model, some evaluation indexes on the results should be given. For example, Nash-Sutcliffe coefficient of efficiency, correlation coefficient, and relative error should be good choices.

It is a good suggestion! We will evaluate the model in the revised manuscript accordingly.

11. English improvement is still needed.

Accepted!