Preliminary Analysis of Ground Water Consumptive Use Reduction within the Wood River Valley Aquifer System

12-13-2021

Background

The goal of this analysis is to determine actions that will be needed to maintain a 4-day rolling average of 32 cfs at Gage 10 on the Little Wood River when the April – September runoff at Hailey is less than 210 KAF. This analysis follows the approach recommended by the TWG in item 2.b. of the Response to Request for Information from the Big Wood River Ground Water Management Area Advisory Committee dated 11-24-2021 (TWG).

Prior to adopting the recommendation of the TWG, other methods of analysis were examined to determine if available data would allow a different approach. Daily steam flow data during the irrigation season are available at Gage 10, but the relationship for direct comparison between steam flows at Gage 10 and the discharge of the Big Wood River at Hailey is confounded by intervening activities that are not currently quantified.

For example, diversions from Silver Creek and losses in Silver Creek and the Little Wood River between the Sportsman Access gage and Gage 10 were quantified on July 7, 2021, but otherwise are largely unknown. Diversions in this reach are reported by the Watermaster after the irrigation season, but the losses for the reach are only known to have been measured on July 7 of this year.

The Sportsman Access gage on Silver Creek is maintained by the USGS, and daily data are available since the 1975 water year. Measurements at this gage are confounded during the irrigation season by ground water pumped into Silver Creek and tributaries upstream of the gage and rediverted downstream of the gage as well as the rotation of points of diversion for Silver Creek natural flow upstream and downstream of the gage.

Analysis

On July 7, 2021, the discharge at Gage 10 was about 26 cfs and the total diversions and losses between the Sportsman Access gage and Gage 10 were about 44 cfs. The analysis method recommended by the TWG is based on an analysis described by Sukow (2021) that recommended an average July - September discharge at the Sportsman Access gage of 99 cfs based on an average reach gain to Silver Creek of 119 cfs. On July 7, 2021, about 70 cfs at Sportsman Access was producing about 26 cfs at Gage 10.

Meeting the goal of 32 cfs at Gage 10 on a 4-day rolling average would require additional discharge at the Sportsman Access gage to meet the 32 cfs and any additional losses that would occur with additional water in the channel between the

Sportsman Access gage and Gage 10. A review of Silver Creek water rights with points of diversion between the Sportsman Access gage and the mouth of Silver Creek showed there are more diversions that can occur in this reach than about 12 cfs that was occurring on July 7, 2021.

Finally, the 99 cfs July – September goal is an average over the 3-month period with expected discharge at the Sportsman Access gage both above and below 99 cfs during that period. With the goal of maintaining 32 cfs rolling 4-day average discharge at Gage 10, a July – September average discharge of 99 cfs at the Sportsman Access gage is reasonable.

The spreadsheet titled Flow Volume Estimates 12-13-21 is posted on the TWG webpage and contains the analysis to implement the recommended analysis (TWG).

In response to the request to consider a multi-tiered approach for consideration by the Advisory Committee (TWG), 3 tiers were developed for this analysis. The first tier is for Hailey April – September discharge in the range of 210 to 155 KAF, the second tier is for discharge in the range of 155 to 100 KAF and the third tier is for discharge less than 100 KAF. The ranges were selected by selecting 100 KAF as a seldom occurring runoff, only 6 times in the 104-year period of record of the Hailey gage and dividing the difference between 100 KAF and 210 KAF.

The upper tier was divided in half resulting in an analysis of 182.5 KAF and the middle tier was also divided in half resulting in an analysis of 127.5 KAF. The final and lowest tier was analyzed for 100 KAF.

In addition to the July-September analysis recommended by IDWR, a review of Gage 10 discharge data shows discharge amounts less than the 32 cfs 4-day rolling average at Gage 10 sometimes occur in June, in addition to the period July – September. A review of the WRV 1.1 curtailment analysis data, show ground water pumping does impact Silver Creek discharge during June in addition to the July – September period. To account for the early season impact, the annual shortages were based on a 122-day period as shown in the spreadsheet referenced above.

The results of this analysis are reported in Response to Request for Guidance from the Big Wood River Ground Water Management Area Advisory Committee dated 12-10-2021 (TWG).

References

Big Wood River Ground Water Management Area Technical Working Group, Response to Request for Information from the Big Wood River Ground Water Management Area Advisory Committee, Prepared for the Advisory Committee by the Technical Working Group, 11/24/2021, https://idwr.idaho.gov/wp-content/uploads/sites/2/groundwater-mgmt/big-wood-gwma-advisory-comm/TWG_response_to_questions_11-24-2021-Final.pdf.

Sukow, J., 2021, Preliminary analysis of groundwater consumptive use reduction within the Wood River Valley aquifer system, https://idwr.idaho.gov/wp-content/uploads/sites/2/groundwater-mgmt/big-wood-gwma-advisory-comm/IDWR-Preliminary-Analysis-of-Consumptive-Use-Reduction-within-the-Wood-River-Valley-Draft-11092021.pdf

TWG – see Big Wood River Ground Water Management Area Technical Working Group https://idwr.idaho.gov/water-rights/groundwater-management-areas/technical-work-group/