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Technical Evaluation of Proposed Transfer No. 84902

Silver Sage Owners Association, Inc.

Brockway Engineering, PLLC

GEP, PE – December 30, 2021

This memo was prepared to evaluate the impact of the proposed transfer no. 84902 to the Big Wood River. The proposed transfer seeks to change the points of diversion and place of use for several water rights, including groundwater rights. The analysis presented here quantifies the impacts of moving the groundwater points of diversion only from the current points of diversion to the proposed new points of diversion. The proposed change to the surface water points of diversion is a downstream move, which will increase flow in more of the Big Wood River, and is not further evaluated in this memo. To evaluate the impact of the POD move of groundwater rights, I evaluated the maximum potential groundwater diversion, assuming no surface water is available.

The groundwater rights to be moved in by this application are water right nos. 37-8409 and 37-22499. Water right no. 37-8409 authorizes the use of groundwater for irrigation uses on 1.7 acres with a priority date of 11/30/1988 and the diversion of 0.1 cfs. Water right no. 37-22499 authorizes the use of groundwater for irrigation uses on 4.9 acres with a priority date of 1/5/1950 and the diversion of 0.1 cfs. I understand that there are outstanding questions raised by the protestants to this transfer that question the validity of these rights. However, based on the fact that IDWR accepted them into the Water Supply Bank, I concluded that these rights were protected from forfeiture.

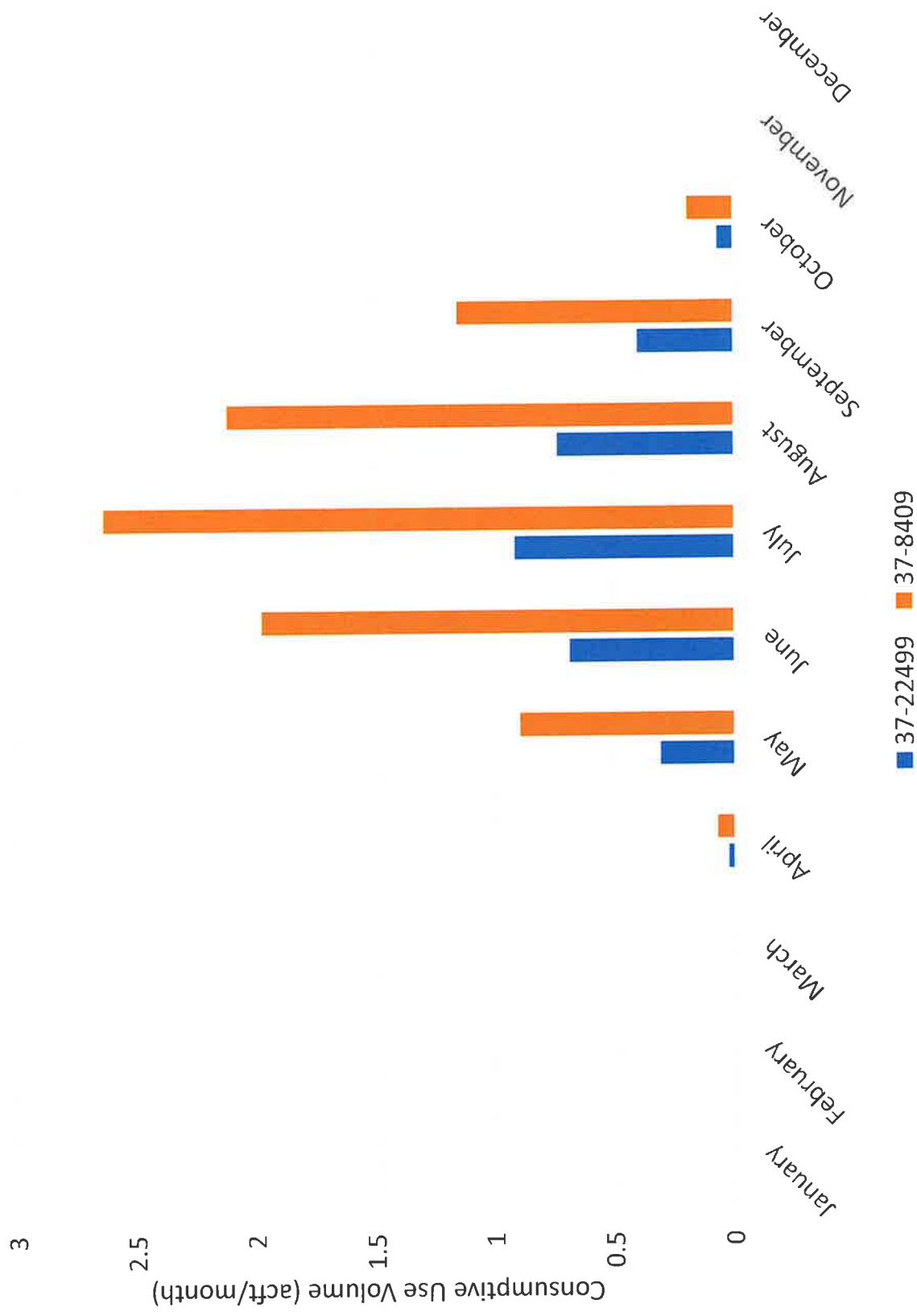
The tool that I used to evaluate the impact of groundwater pumping to the Big Wood River was the Wood River Valley Aquifer Model Version 1.1 (Wiley et al., 2019). Version 1.0 of this tool was developed by the USGS in collaboration with IDWR (Fisher et al., 2016). The MODFLOW groundwater model was calibrated to river reach gains/losses – one of the river reaches was the Near Ketchum to Hailey reach. The near Ketchum to Hailey reach corresponds to the minimum stream flow water rights held by the Idaho Water Resource Board (water right nos. 37-7919 for 70 cfs with a priority date of 6/19/1981 and 37-8307 for 119 csf with a priority date of 10/16/1987).

The applicant has not used the groundwater rights in the recent history, because they were in the Water Supply Bank. Therefore, to evaluate the use of these water rights, I first evaluated the impact of the groundwater rights at the current Points of Diversion with irrigation of turf on 6.6 acres, that are authorized under these water rights. Using the consumptive use (CU) for irrigated turf from the Hailey Ranger Station published by ET-Idaho (Allen and Robison, 2017), it was determined that the consumptive use of turf on 6.6 acres was 1.86-ft/acre and had the following monthly CU percent's: April = 0.8%, May = 9.9%, June = 21.8%, July = 29.2%, August = 23.4%, September = 12.8%, and October = 2.1%. Because the water rights were in the Water Supply Bank, I concluded that the WRV Model did not include them in the calibration model runs. Therefore, I added the CU diversion volume to the current PODs, weighted to the acres authorized from each water right, and used the authorized CU diversion as the baseline model run. Figure 1 shows the hydrographs of the CU volume diverted under each water right. Water right no. 37-8409 POD is located in WRV model cell no. 271, 79. Water right no. 37-22499 POD is located in WRV model cell no. 259, 72. Figure 2 shows the locations of the current POD and the WRV model cells.

Impact to the Big Wood River can occur when the transfer is accomplished and the CU volume is diverted at the proposed PODs. Figure 2 also illustrates the location of the proposed PODs. To model the

impact, I used a combination of simulated 10-years pumping the CU volume at the current PODs and then changed the PODs to an equal diversion of CU volume divided equally between the three proposed PODs for the next 10-years. The transfer model scenario was then compared to the baseline model with CU volume diverted at the current PODs during the entire calibration period. The difference in reach gain within the Near Ketchum to Hailey reach is a quantification of the impact of the proposed transfer. A hydrograph of the simulated impacts is shown in Figure 3. There is a slight decrease in flow in this river reach (Maximum impact of -0.002 cfs, average impact of -0.0015 cfs) during the first year of diversion, followed by increased flow in the reach of the river (Maximum impact of 0.001 cfs, average impact of 0.001 cfs).

Figure 1: Consumptive Use Volume at Current Points of Diversion



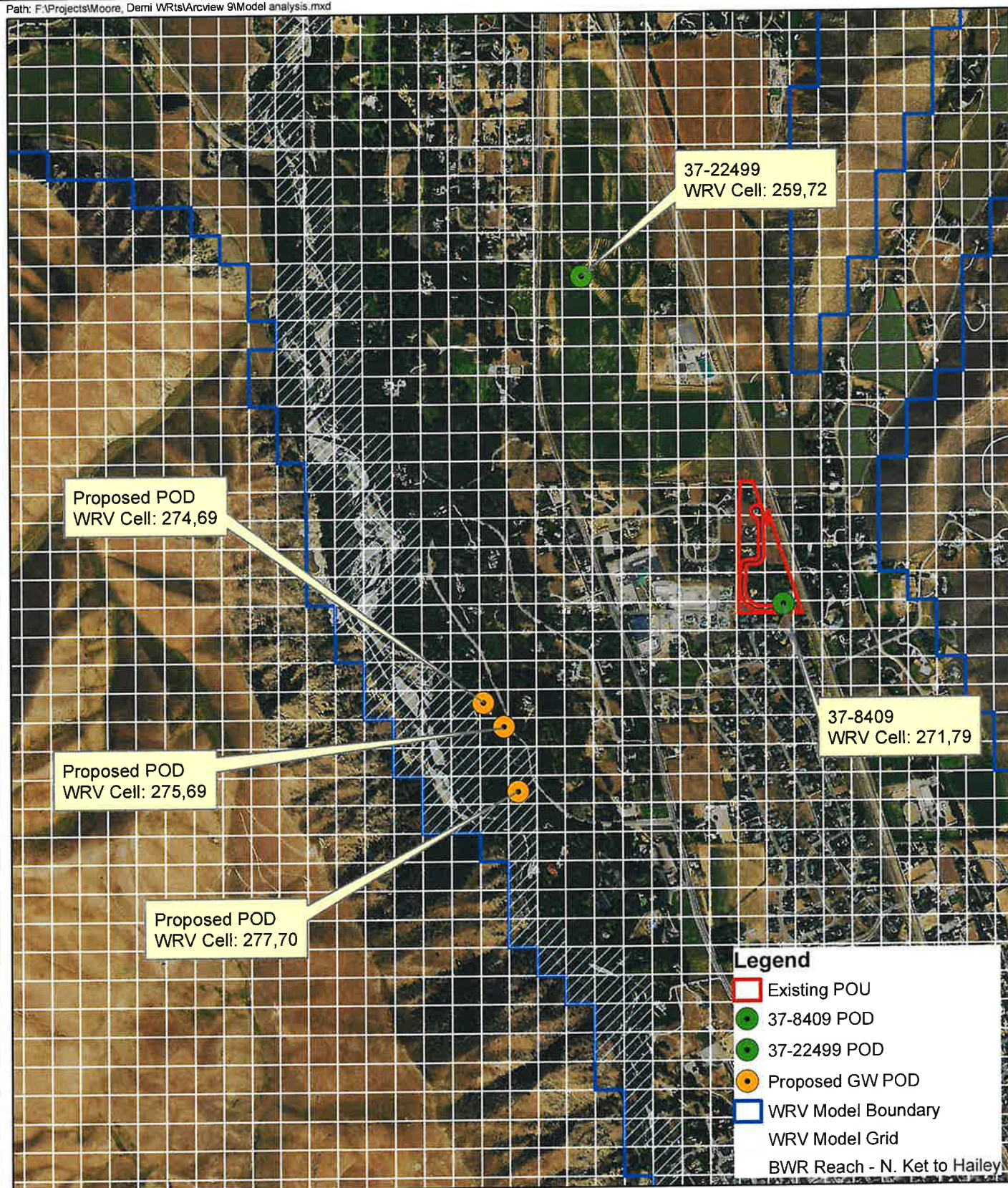


FIGURE 2: SILVER SAGE OWNERS ASSOCIATION INC.

WRV MODEL RUN

0 625 1,250 2,500 Feet

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Figure 3: Simulated Impacts to the Big Wood River - Near Ketchum to Hailey Reach
WRV Model v. 1.1 Simulation

