

MEMORANDUM

FROM: Jennifer Sukow, IDWR Hydrology Section
TO: Monica Van Bussum, IDWR Water Supply Bank Coordinator
CC: Sean Vincent, IDWR Hydrology Section Manager
DATE: April 11, 2012
RE: Review of **Amended** Lee Sutton Application to Rent Water from the Water Supply Bank

Introduction

Lee Sutton submitted an amended application to rent groundwater to irrigate 65 acres from 2012 through 2015. A portion (227.5 AF/year) of water right 22-7336 is being considered for rental to Mr. Sutton. The amendment is a reduction in acres from the original application, which was discussed in a previous memorandum dated February 22, 2012. The Hydrology Section was requested to provide an assessment of potential impacts of the amended water supply bank rental application.

The proposed point of diversion and rental water right point of diversion are located within the Eastern Snake Plain Aquifer (ESPA). Guidance for approving transfers which propose a change to points of diversion in the ESPA is contained in Administrative Transfer Processing Memorandum No. 24, dated January 21, 2009. Because the proposed Water Supply Bank rental would in effect be a temporary change to the points of diversion, potential impacts to the Snake River can be evaluated using this guidance. The transfer guidance indicates that a change which increases depletions to a modeled reach of the Snake River by greater than 10 percent must be fully mitigated, unless the increased depletion is less than two acre-feet per trimester or the total steady-state depletion to the reach is less than 10 percent of the total depletion.

Figure 1 shows the locations of the proposed point of diversion and the points of diversion for the available water rights. The proposed point of diversion is located within the ESPAM1.1 model in cell 1068181. The point of diversion for water right 22-7336 is located in model cell 1061184.

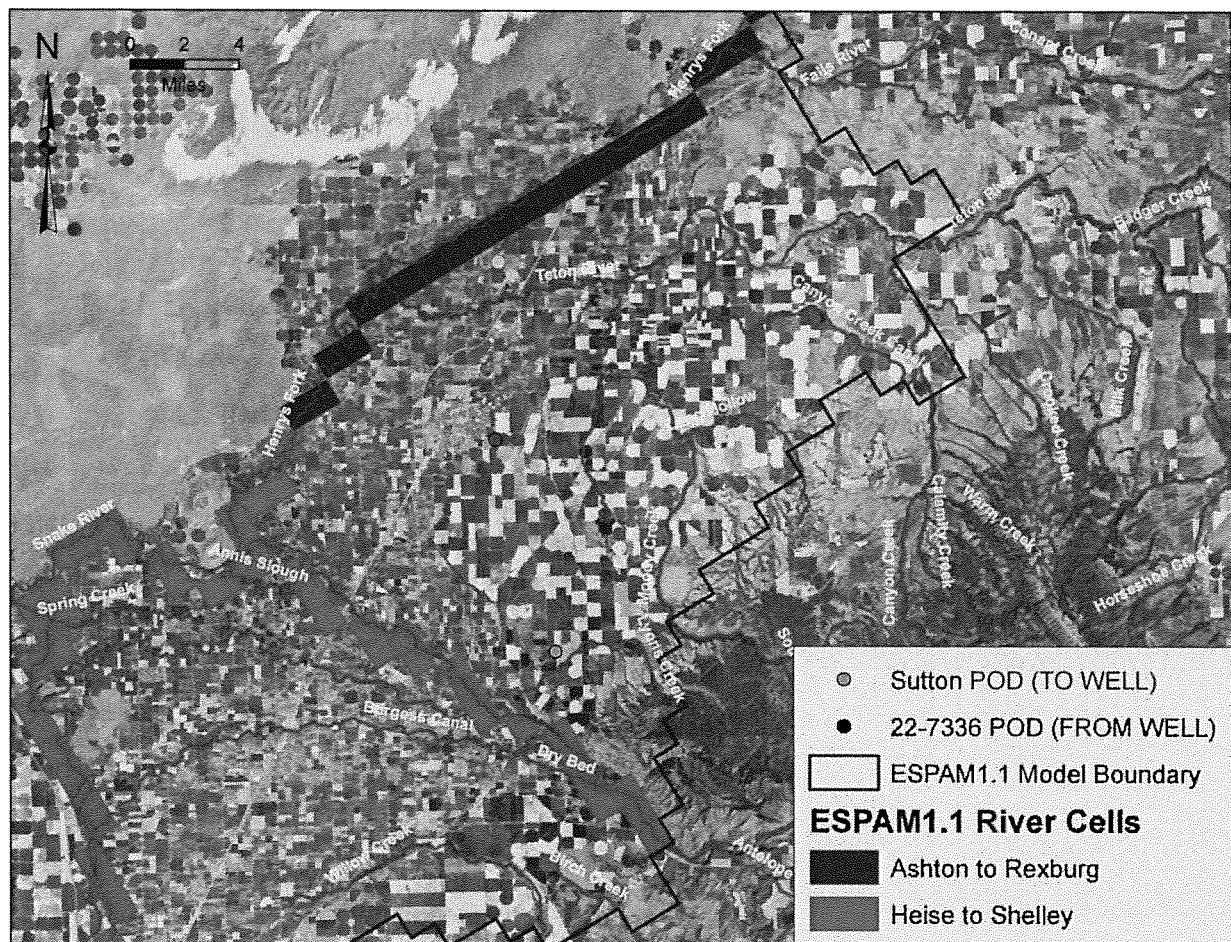


Figure 1. Location map.

Methodology

Potential impacts to the Snake River were evaluated using the ESPA Transfer Spreadsheet Version 3.1. Water right 22-7336 and the proposed Sutton point of diversion were modeled in cells 1061184 and 1068181, respectively.

The effects without transfer were modeled assuming that water right 22-7336 had not been leased to the Water Supply Bank and was diverted each spring and summer. Winter trimester diversions were modeled as zero. For water right 22-7336, diversion of 113.75 AF in each spring and summer trimester was modeled, beginning in the spring of 1981, based on the water right priority date of 10/22/1980.

The effects with transfer were modeled assuming that water right 22-7336 was diverted each spring and summer trimester beginning in 1981 and ending when leased to the water supply bank. During 2012 through 2015, diversion of 113.75 acre-feet was modeled at the Sutton point

of diversion in each spring and summer trimester. Diversion of water right 22-7336 was assumed to resume at the original location beginning in the spring of 2016.

The effects without and with transfer were also modeled assuming that the water right volume was diverted year-round at a rate of 75.83 AF/trimester. This was requested to provide smoothed output that is easier to view graphically. However, this method results in slightly lower peak trimester impacts.

Results

Because of the locations of the points of diversion between the Henry's Fork and South Fork of the Snake River, significant effects on modeled Snake River gains are limited to the Ashton to Rexburg and Heise to Shelley reaches. Net changes to depletions and accruals in other modeled reaches are less than 2.0 acre feet per trimester. Net transfer effects on reaches above Milner are shown in Figure 2. The transient increase in depletions to the Heise to Shelley reach peaks in the summer trimester of 2015 at 19.9 acre-feet. Modeling the net transfer effects assuming year-round use results in a lower peak depletion of 15.1 acre-feet to the Heise to Shelley reach (Figure 3).

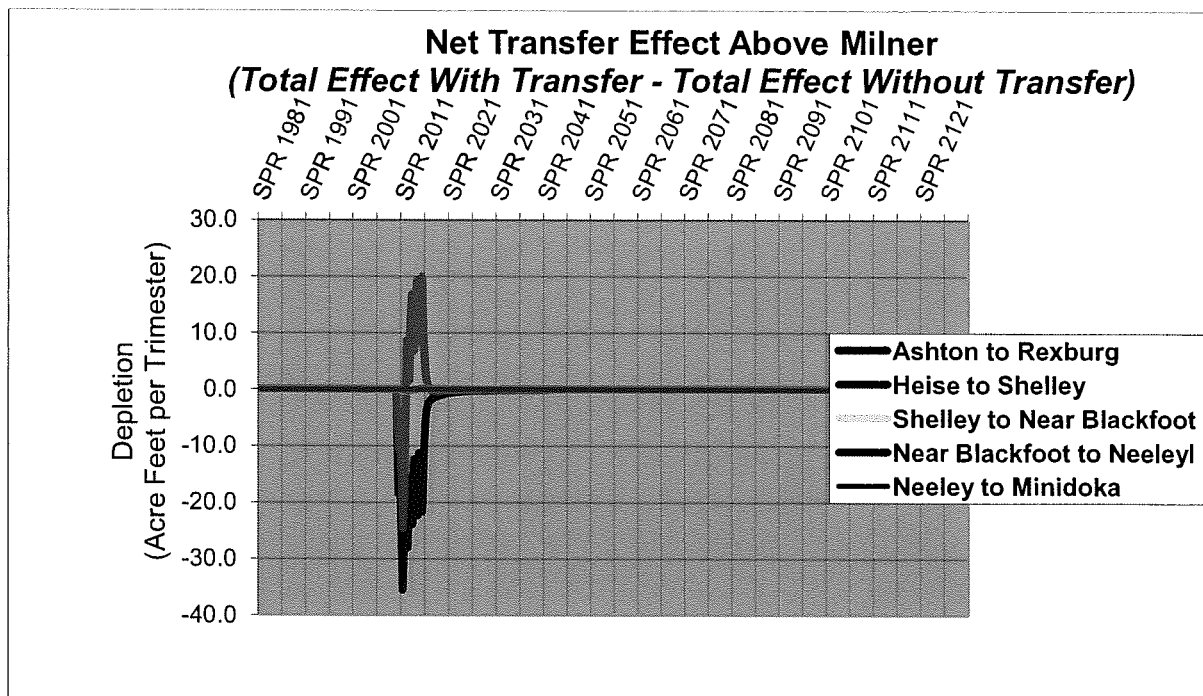


Figure 2. Net effect on modeled river reaches above Milner.

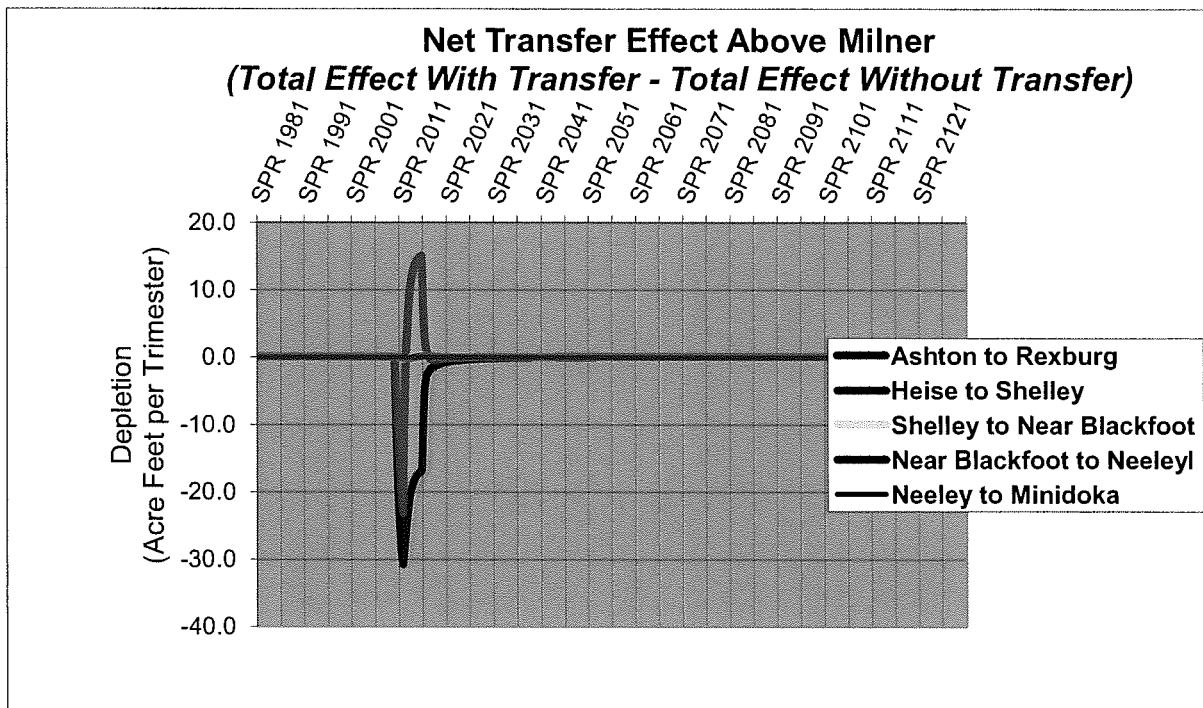


Figure 3. Net effect on modeled river reaches above Milner, assuming year-round water use.

The percentage increase in transient depletions to the Heise to Shelley reach peaks at 57% in the summer trimester of 2015 (Figure 4). Modeling the net transfer effects assuming year-round use results in a lower peak increase in depletions of 49% to the Heise to Shelley reach (Figure 5). Percentage increases in depletions to other reaches are not relevant, because the net increase in depletions is less than 2.0 acre-feet per trimester.

Hydrologic responses in the Ashton to Rexburg and Heise to Shelley reaches are shown in Figures 6 through 9.

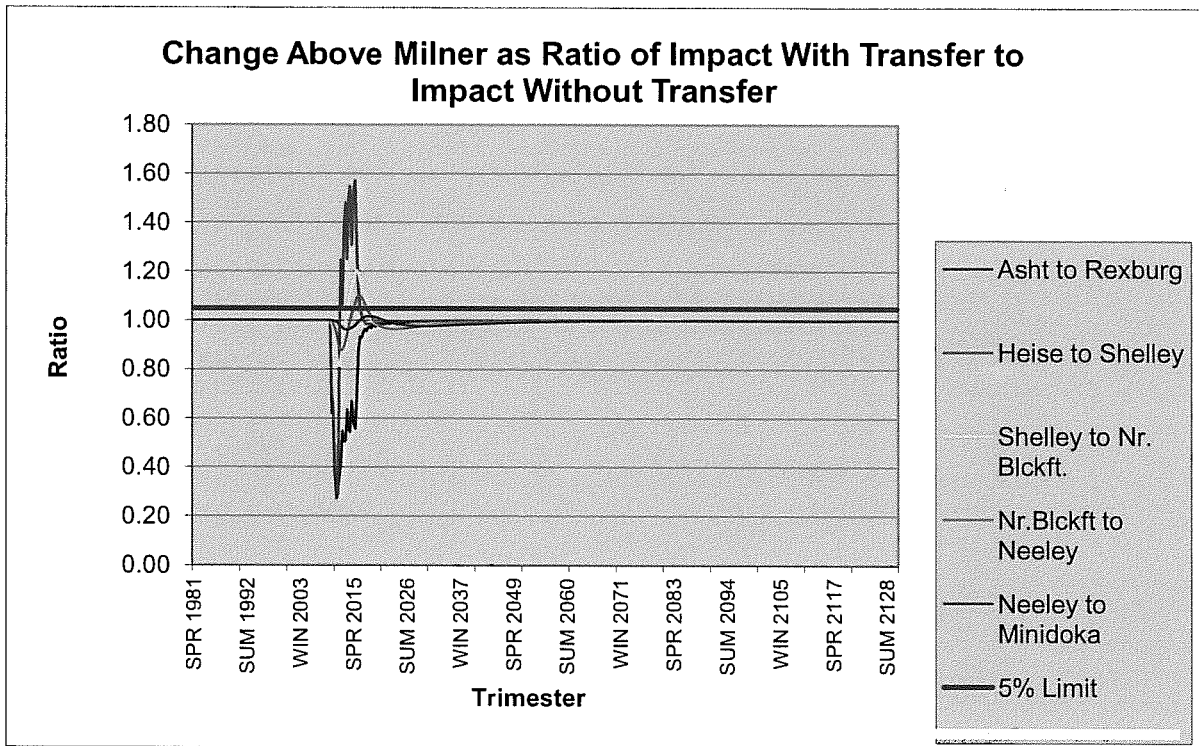


Figure 4. Change in depletions to reaches above Milner.

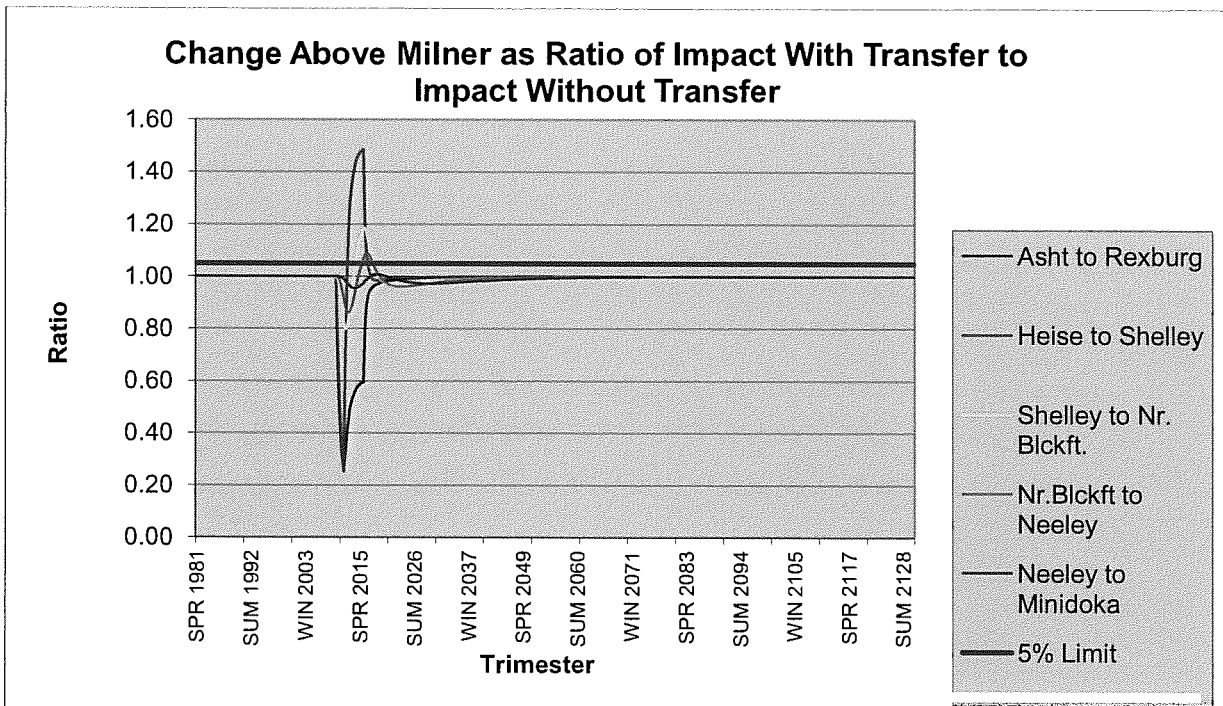


Figure 5. Change in depletions to reaches above Milner, assuming year-round use.

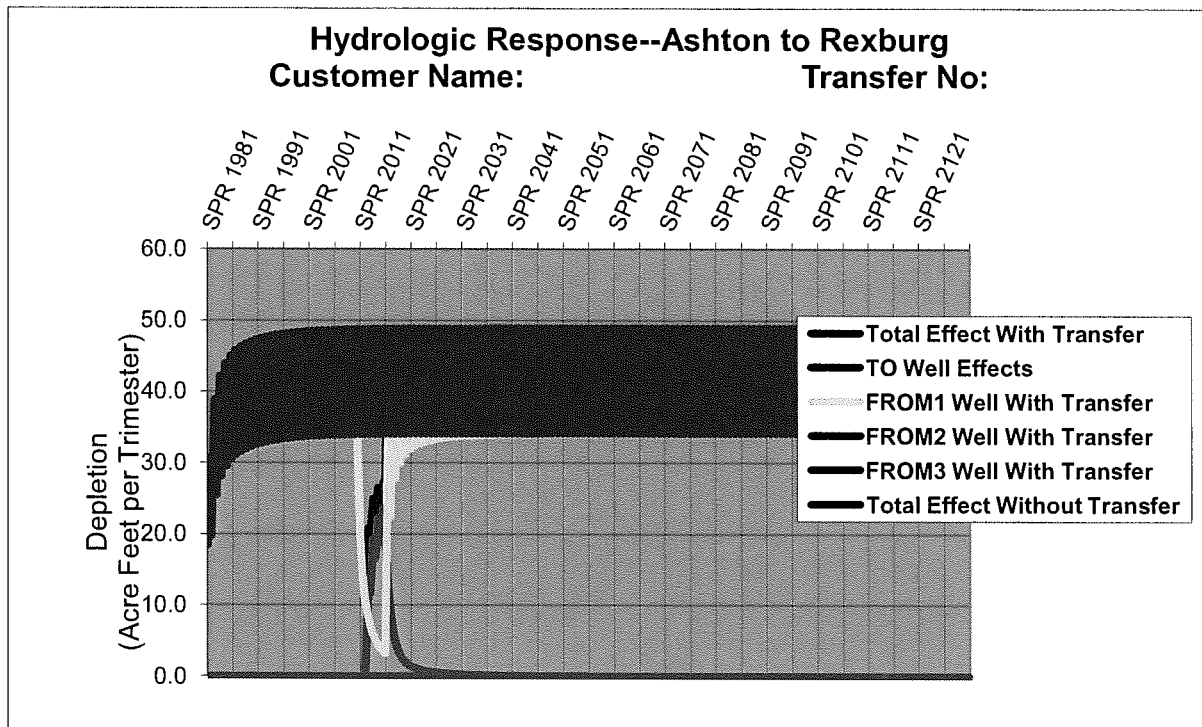


Figure 6. Hydrologic response in Ashton to Rexburg reach.

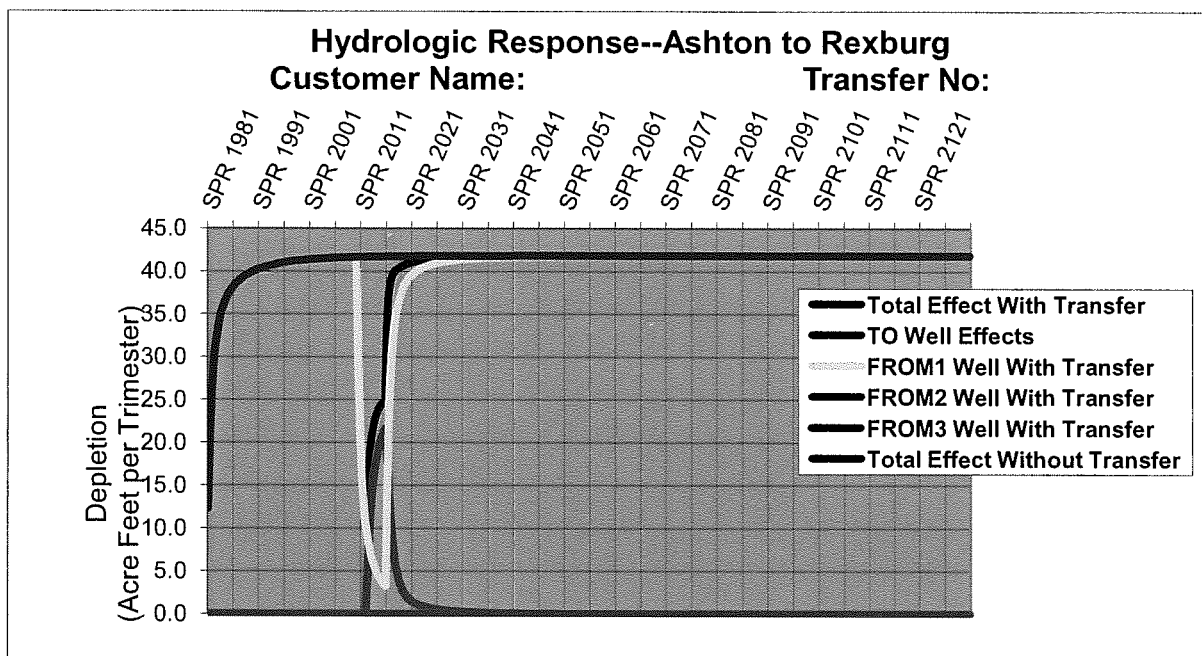


Figure 7. Hydrologic response in Ashton to Rexburg reach, assuming year-round use.

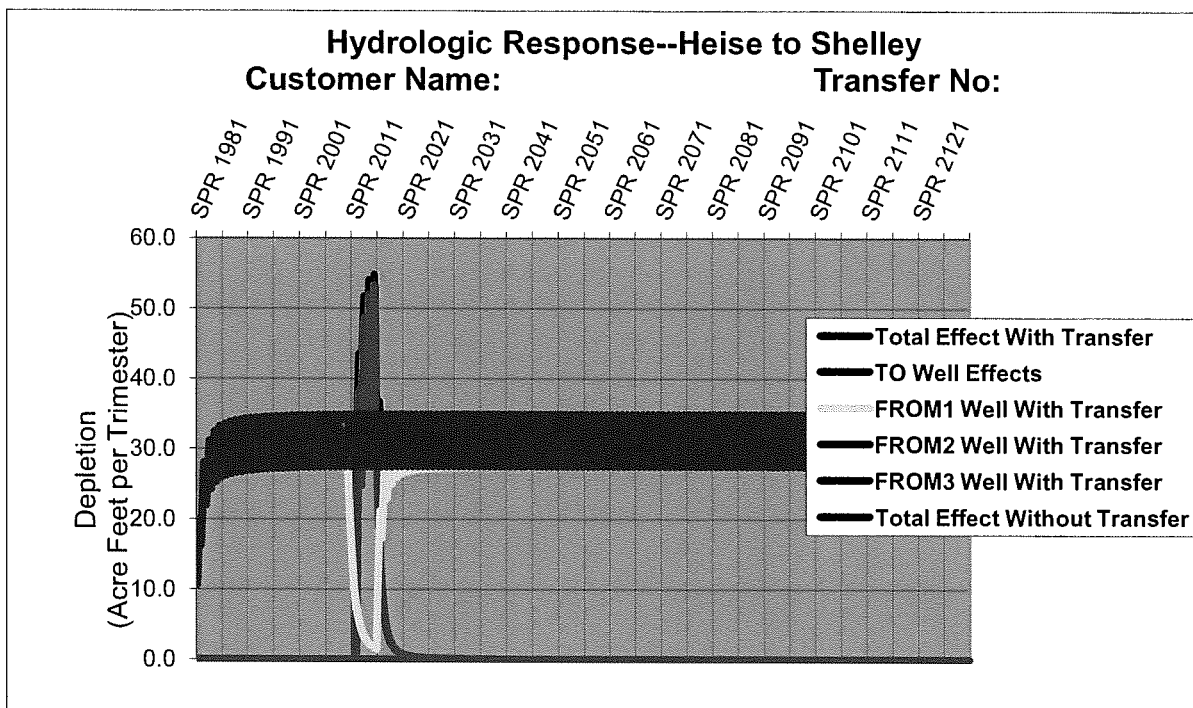


Figure 8. Hydrologic response in Heise to Shelley reach.

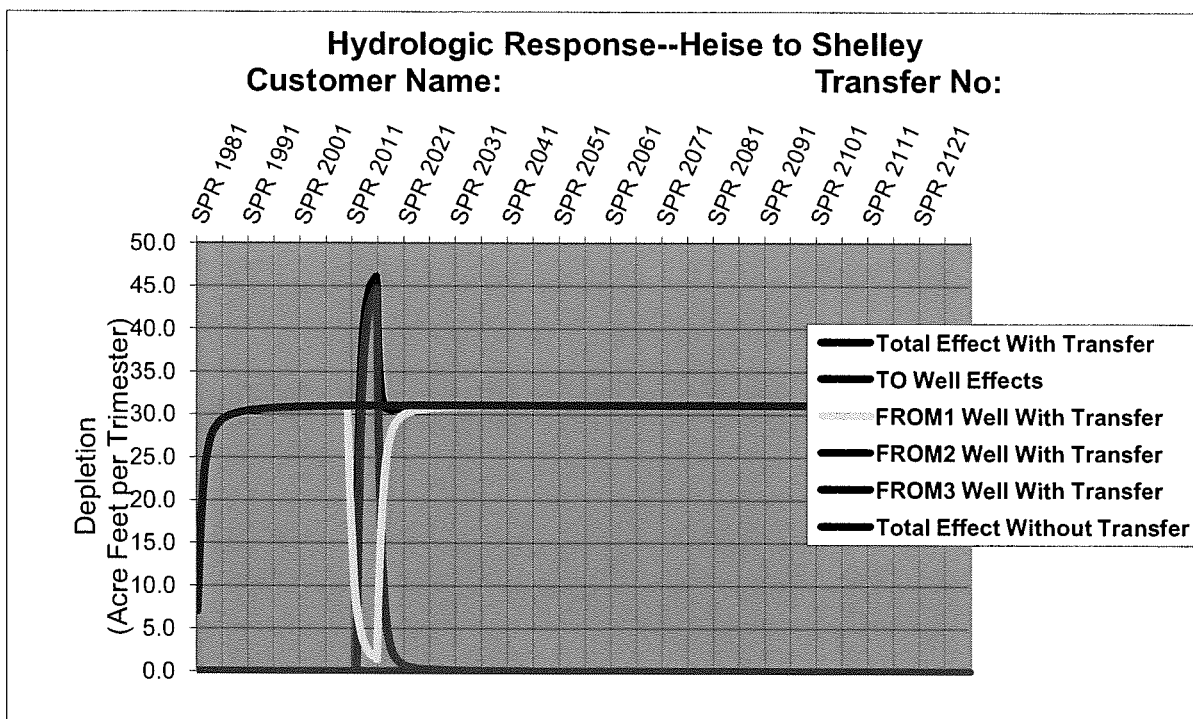


Figure 9. Hydrologic response in Heise to Shelley reach.

Conclusions

The following conclusions are based on analysis of the proposed water bank rental using the ESPA Transfer Spreadsheet Version 3.1.

1. Significant effects (exceeding 2.0 acre-feet per trimester) on Snake River gains are expected to be limited to the Ashton to Rexburg and Heise to Shelley model reaches.
2. Model results indicate that reach gains in the Ashton to Rexburg reach will increase during the rental period, with a transient benefit of 21.7 acre-feet in the summer trimester of 2015.
3. Model results indicate that reach gains in the Heise to Shelley reach will be depleted during the rental period, with a peak transient depletion of 19.9 acre-feet in the summer trimester of 2015.
4. The net benefits of ceasing diversion at the original water right point of diversion during the rental period accrue to the Ashton to Rexburg reach through 2039, exceeding 2.0 acre-feet through spring 2017.
5. The net increase in depletions to the Heise to Shelley reach occurs over a slightly shorter period, and exceeds 2.0 acre-feet through spring 2016. The modeled increase in depletions exceeds 10% from summer 2012 through spring 2016.
6. Administrative Transfer Processing Memorandum No. 24 states, *"Increased depletions greater than 10 percent for any reach are presumed to cause injury..."* Per this guidance, injury to water rights in the Heise to Shelley reach would be presumed and mitigation would be required.