
MEMORANDUM

TO: BRIAN PATTON, TIM LUKE
FROM: TROY WINWARD
SUBJECT: E.M. BELL DITCH EXCHANGE
DATE: 2/8/2005

Overview:

This memo outlines several options for water delivery changes and to discontinue use of the E.M. Bell Ditch. First, certain water rights (Gisler, Harry and Brad) delivered by the E.M. Bell ditch could be exchanged between Billingsley Creek and the Snake River and the rest of the E.M. Bell water rights could be transferred to the Buckeye Ditch. About two-thirds of the water rights in the E.M. Bell ditch could be pumped out of the Snake River, thus, eliminating conveyance losses associated with the ditch. Secondly, install a more extensive system from a Snake River Pump and exchange all the E.M. Bell ditch water rights to the Snake River with the exception of the Wickam water right. Third, transfer the delivery of all the E.M. Bell delivered water rights to the Buckeye Ditch. The objective of all these options would be to allow greater flow down Billingsley Creek to fulfill more junior water rights on the tail end of the creek that have been historically short of water (i.e.; Boyer, Sturdivant, etc)

Proposal A

The E.M. Bell ditch users Harry Gisler, Brad Gisler, and U.S.A acting through Department of Interior (Gisler runs U.S.A ground) accounts for 10.83 cfs out of the 16.99 cfs allotted water rights serviced by the E.M. Bell Ditch. In discussion, Brad Gisler has suggested an exchange between his E.M. Bell water with water pumped directly from the Snake River. The combination of installation of a pump from the Snake River to service Gisler/U.S.A.D.I. property and transfer of delivery of other rights from the E.M. Bell ditch to the Buckeye ditch would allow diversion into the E.M. Bell Ditch to be discontinued.

It is seen from Figure 1 that the total diversion did not typically amount to the 16.99 cfs. The average measured diversion from E.M Bell Ditch in 1995, 1997-2003 was 8.60 cfs. The maximum measured diversion in this same time period was 23.32 cfs. The discharges were measured using stage discharge relationship, which was checked on June 22 and October 18, 1995, and it was found that it underestimated the flow slightly. The hydrograph for 1995 is seen in figure 1 and is the most reliable year of flow measurements. The average ditch flow in 1995 was 5.6 cfs and had a maximum measured discharge of 13.42 cfs.

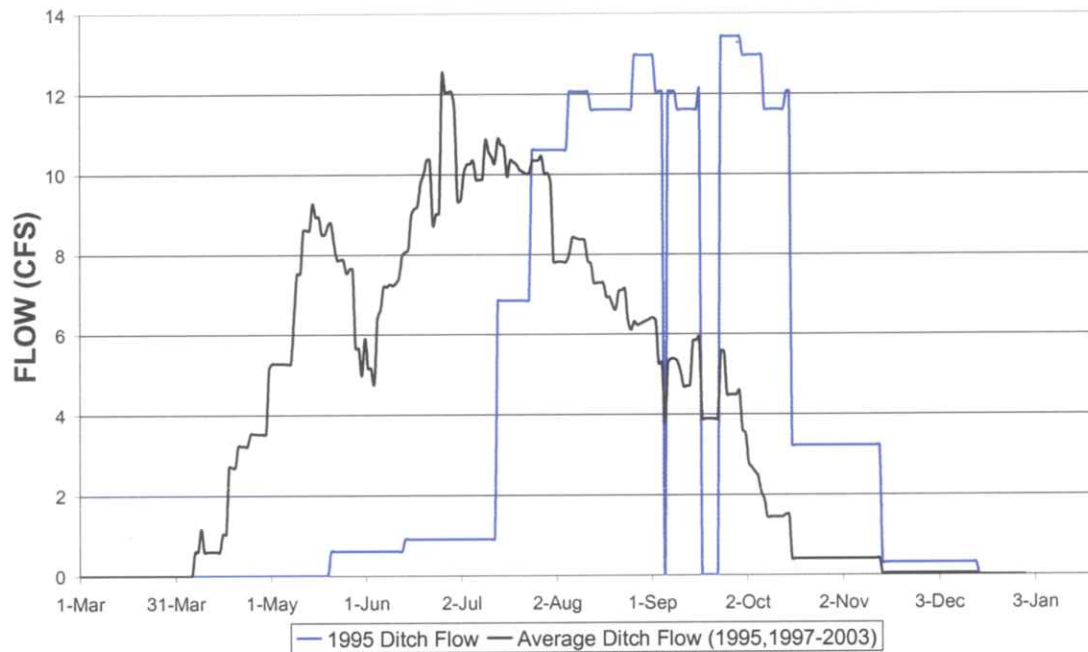


Figure 1. E.M. Bell ditch diversion rates for 1995 and average ditch flow 1995, 1997-2003.

The elevation difference from the Snake River to Gisler’s place of use (POU) was estimated to be roughly 75-100 ft. The distance from the river to the edge of the Gisler POU is approximately 200 ft. However, to the middle of Gisler’s POU is approximately 1700 ft. More detail of the current irrigation system is necessary to obtain an estimate of mainline installation requirement. It is known from the site visit that Brad Gisler operates a full circle ¼ mile pivot, a ¾ circle 5-tower pivot, two ¼ mile wheel lines, and an additional short wheel line. I have assumed that Brad Gisler operates the Harry Gisler property. The combination of Harry Gisler, Brad Gisler, and U.S.D.I. water rights total 10.83 cfs. However, 4.58 cfs out of 7.32 cfs of the Harry Gisler 36-21B water right is subordinated to surface water rights and ground water rights with priority dates of December 31, 1999 or earlier. Furthermore, 1.84 cfs of the unsubordinated portion of right 36-21B is limited to use for conveyance losses in delivery of this right. If the proposed pump were installed the conditions of delivery of the subordinated water right would need to be addressed.

The delivery of remaining 6.16 cfs of water to the rest of the associated E.M. Bell ditch water rights could be delivered by the Buckeye ditch. However, Frank Erwin Water District 36-A water master, thought that shutting off the Bell ditch head gate wouldn’t necessarily dry up the Bell ditch but some continued flow would come from seeps and drains along the length of the ditch. If this is true, it is a possibility that there would be enough of this continued seepage and drainage flow to service the small tail end users. He suggested we shut off the Bell Ditch head gate sometime in the winter to get an estimate of the amount of flow that would continue in the Bell Ditch as a result of seeps

and drains. Table 1 lists the water right holder delivered by the E.M. Bell ditch and their current mode of delivery.

It is shown from the map (Fig. 2) that the Shaffer, Martinat, Brown, and Mays POU's are relatively close to each other. If the Bell Ditch did not have enough continued wastewater flow to service these users (2.51 cfs), then a conveyance line from the Buckeye Ditch down to Shaffer, Brown, Martinat, and Mays POU would be necessary. The length of this lateral would be from 450 to 700 ft depending on place of use.

Table 1. Water Rights Current and Proposed Mode of Delivery.

Owner	Seq. #	Suffix	Delivery Mode on Water Right	Proposed Delivery
Gisler, Harry	21	B	E.M. Bell Ditch	Snake River Pump
United States of America Acting through Dept. of Interior	21	C	E.M. Bell Ditch	Snake River Pump
Robert Brad Gisler	24		E.M. Bell and Buckeye Ditch	Snake River Pump
Brown, Lloyd	26		E.M. Bell and Buckeye Ditch	Buckeye Ditch
Shaffer, Roger	34	B	E.M. Bell Ditch	Buckeye Ditch
Brown, Lloyd	34	E	E.M. Bell Ditch	Buckeye Ditch
Martinat, Rick	34	F	E.M. Bell Ditch	Buckeye Ditch
Mays, Harold	34	G	E.M. Bell Ditch	Buckeye Ditch
Brown, Lloyd	35	E	E.M. Bell and Buckeye Ditch	Buckeye Ditch
Wickham, Doug E.	67		E.M. Bell Ditch	Buckeye Ditch
Rowland, Byron	77	A	E.M. Bell Ditch	Buckeye Ditch
Childs Family Trust	77	B	E.M. Bell Ditch	Buckeye Ditch
Gisler, Bradley	77	D	E.M. Bell Ditch	Buckeye Ditch
Adkinson, Albert L	77	E	E.M. Bell Ditch	Buckeye Ditch
Kaneaster, Curt	16306		E.M. Bell and Buckeye Ditch	Buckeye Ditch
Bender, Patricia	16307		E.M. Bell and Buckeye Ditch	Buckeye Ditch

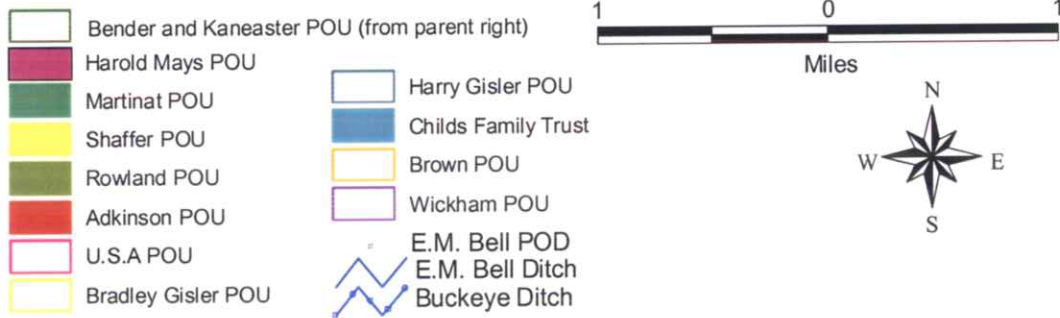
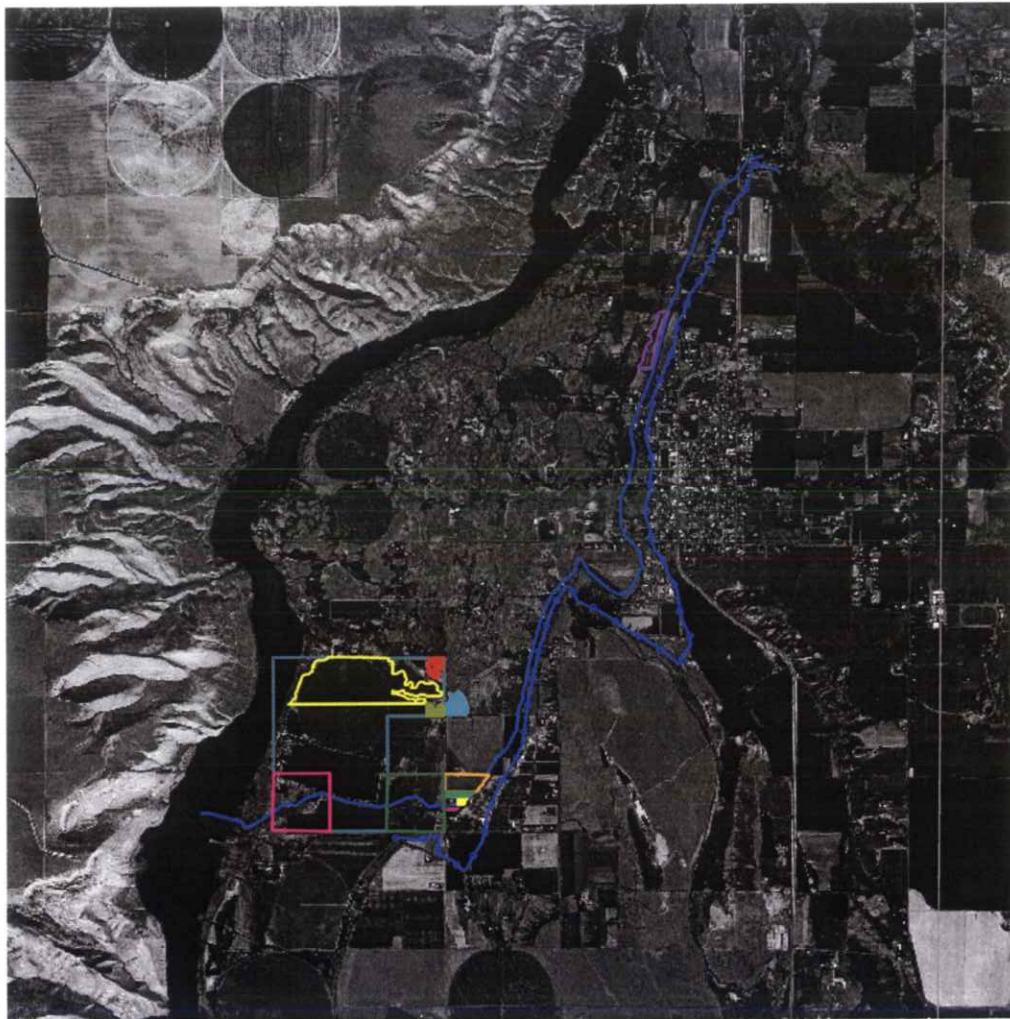


Figure 2. E.M. Bell ditch places of use. (Some of the POU's are based on parcels).

The Kaneaster and Bender decreed water right reports indicate that their water is delivered through the Bell and Buckeye Ditches and it is assumed that their full rights could be delivered through the Buckeye Ditch via an existing lateral

The Adkinson, Childs Living Trust, Rowland, and Wickham rights could also be delivered from a lateral off the Buckeye. Frank Erwin informed me that an existing lateral could deliver water to Adkinson and Rowland. I would assume this lateral would also deliver the Childs Family Trust water right. It would be necessary to put a pipe across the Bell Ditch to convey this water. The Wickham water right would require a new lateral from the Buckeye ditch with a length of approximately 400 ft and capacity of 0.36 cfs.

More extensive site studies are necessary to refine details of required laterals to convey these water rights from the Buckeye Ditch. Easements would need to be obtained for new laterals. Any new lateral would require a head gate and some would need to be piped across the Bell Ditch. Additionally, the issue of whether the Buckeye ditch has the capacity to carry the additional flow needs to be investigated. Frank Erwin believes the Buckeye has enough capacity to support the additional flow (6.16 cfs). The conveyance loss portion of the water rights would have to be reevaluated for each change in delivery. Table 2 lists the water rights with associated delivery loss in the decreed rights.

The economics of installation of a pump and irrigation system from the Snake River must be evaluated to determine feasibility. Power transmission line installation costs and on-going power consumption costs need to be evaluated to determine long-term economics of the proposed system. Due to land ownership issues, it may not be feasible to include the U.S.A.D.I. water right in the Gisler Snake River pump system.

Proposal B

The conveyance system from the proposed Snake River Pump could be extended to service all the POU's with the exception of the Wickham. This would entail a more extensive pressurized conveyance system to service the fifteen water rights. This alternative would more effectively utilize the pump installation and associated costs. It would provide for a greater amount of water to remain in Billingsley Creek. The amount would be 16.63 cfs in "paper" water rights but would more realistically be the 6 cfs average flow as seen in the E.M. Bell ditch hydrograph 2003 (Fig. 1). Conveyance losses would be eliminated with the exception of the Wickham diversion, which would either be serviced from the Buckeye ditch or from the north end of the E.M. Bell ditch. Providing flow from the Buckeye ditch to this POU would probably be preferred because it is a small flow (0.36 cfs) and the approximate mile of the E.M. Bell Ditch would then not need to be maintained. The disadvantages of this alternative are the expense of installing a more extensive pipeline network and the associated power costs of pumping.

Proposal C

Instead of installing a pump from the Snake River, the delivery of all the water rights associated with the E.M. Bell ditch could be delivered by the Buckeye ditch including the Gisler water rights. This alternative's feasibility is clearly dependant on the capacity of the Buckeye Ditch to support the additional flow. It is also dependant on the ability to transfer all of the water rights delivery to the Buckeye ditch. As with the original alternative laterals would need to be constructed from the Buckeye ditch to the POU's. This alternative would eliminate annual pumping cost and associated pump and power line installation costs. This option would not be as beneficial in leaving flow in Billingsley Creek with exception of any possible conserved conveyance losses.

Table 2. E.M. Bell Water Rights with Associated Conveyance Loss Limits.

Owner	Water Right	Div. Rate (cfs)	Div. Rate Limited to Conveyance Loss (cfs)		Recommendation Diversion Rate @ field head gate
			If Delivered through Bell	If Delivered through Buckeye	
Gisler, Harry	336-21B	7.32	1.84	n/a	
United States of America Acting through Dept. of Interior	36-21C	0.3	1.84	n/a	
Robert Brad Gisler	36-24	0.87			
Lloyd Brown	36-26	2.08	0.48	0.04	1.6
Shaffer, Roger	36-34B	0.03			
Brown, Lloyd	36-34E	0.1			
Martinat, Rick	36-34F	0.06	0.03		
Mays, Harold	36-34G	0.03			
Brown, Lloyd	36-35E	0.21			
Doug E. Wickham	36-67	0.36	0.02	n/a	
Rowland, Byron	36-77A	0.1			
Thomas Jackson Childs Living Trust	36-77B	0.7	0.016 in irrigation season 0.19 in non-irrigation season		0.54
Gisler, Bradley	36-77D	2.34	0.19	n/a	
Adkinson, Albert L.	36-77E	0.09	0.19	n/a	
Kaneaster, Curt	36-16306	2.25			
Bender, Patricia	36-16307	0.15			

Summary

The benefit from implementing one of these proposed projects would be additional flow in Billingsley Creek to assist in delivery of tail end junior water rights. Frank Erwin said that last year he was only able to deliver 3 to 4 out of 10 to 11 cfs to the Boyer (Fig. 3) fish propagation water right and 15 out of 25 cfs to Sturdivant (Fig. 4). Discontinued use of the E.M. Bell ditch could add 8.60 cfs or more to Billingsley Creek based on the average ditch flow from 1995,1997-2003. The cumulative flow for these years range from 2162 acre-feet/year (2000) to 3874 acre-feet/year (2001) with an average of 2607 acre-ft/year. (It is important to note that the discharge was measured with a stage-discharge relationship that was checked on June 22 and October 19, 1995 and slightly underestimated actual flow. This stage-discharge rating may have been less accurate during the period from 1997 to 2003).

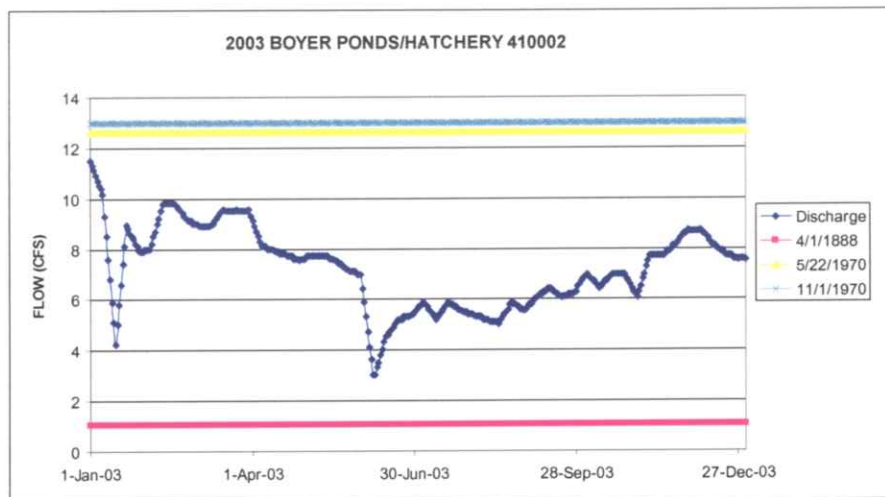


Figure 3. Hydrograph at Boyer diversion with associated water rights 2003.

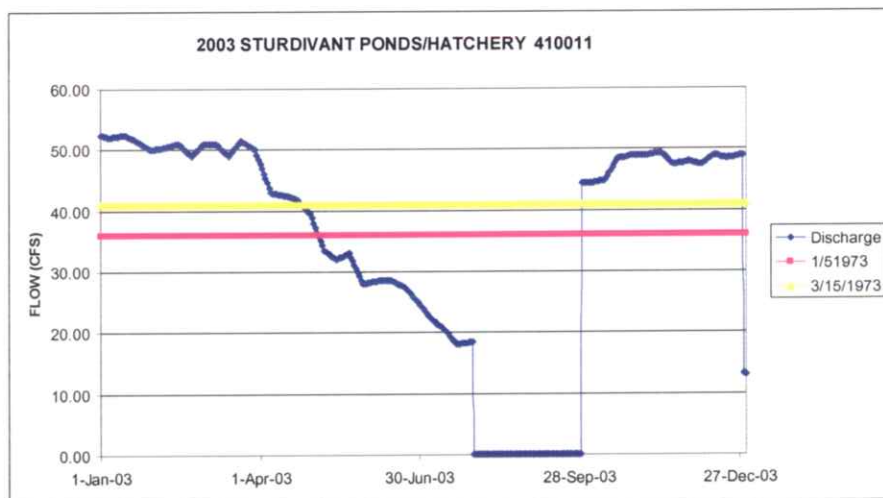


Figure 4. Hydrograph at Sturdivant diversion with associated water rights 2003.

Table 3. Water Rights delivered by the E.M. Bell Ditch.

Owner	Water Right	Div. Rate	Acres	Priority Date	Use	Delivery Mode on Water Right
Gisler, Harry United States of America Acting through Dept. of Interior	36-21B	7.32	137	03/30/1884 Subordinated- 12/31/1999	Irrigation and Stock water	E.M. Bell Ditch
	36-21C	0.3	12	03/30/1884	Irrigation	E.M. Bell Ditch
Robert Brad Gisler	36-24	0.87	34	03/30/1884	Irrigation	E.M. Bell and Buckeye Ditch
Brown, Lloyd	36-26	2.08	40	03/30/1884	Irrigation and Stock water	E.M. Bell and Buckeye Ditch
Shaffer, Roger	36-34B	0.03	1	03/30/1884	Irrigation	E.M. Bell Ditch
Brown, Lloyd	36-34E	0.1	8	03/30/1884	Irrigation	E.M. Bell Ditch
Martinat, Rick	36-34F	0.06	1.5	03/30/1884	Irrigation and Stock water	E.M. Bell Ditch
Mays, Harold	36-34G	0.03	1	03/30/1884	Irrigation and Stock water	E.M. Bell Ditch
Brown, Lloyd	36-35E	0.21	8	09/10/1884	Irrigation	E.M. Bell and Buckeye Ditch
Wickham, Doug E.	36-67	0.36	7	03/30/1884	Irrigation	E.M. Bell Ditch
Rowland, Byron	36-77A	0.1	2	03/30/1884	Irrigation	E.M. Bell Ditch
Childs Family Trust	36-77B	0.7	8	03/30/1884	Irrigation and Stock water	E.M. Bell Ditch
Gisler, Bradley	36-77D	2.34	61	03/30/1884	Irrigation and Stock water	E.M. Bell Ditch
Adkinson, Albert L	36-77E	0.09	2.3	03/30/1884	Irrigation and Stock water	E.M. Bell Ditch
Kaneaster, Curt	36-16306	2.25	29	03/30/1884	Irrigation	E.M. Bell and Buckeye Ditch
Bender, Patricia	36-16307	0.15	2	03/30/1884	Irrigation	E.M. Bell and Buckeye Ditch