

Project No. 818-03-2013

Expert Report and Narrative Relative to Impact of Proposed Plan by Flying Heart Ranch Owners Association (FHROA) for Spring Flow Enhancement

Prepared for:

Flying Heart Ranch Owners Association.
Hailey, Idaho

November 26, 2014

For information concerning this report, contact
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Table of Contents

A. Summary.....	1
B. Background.....	1-2
B.1. Stream and Pond System Water Source.....	2
B.2. History of Development.....	2-3
B.3. Flying Heart Ranch Water Rights.....	3
C. Application for Permit 37-22876.....	3
C.1. Water Source.....	3-4
C.2. Description of Proposed Points of Diversion.....	4
D. Water Delivery to Existing Channels from Pipeline Wells.....	4
E. Evaluation of Permit Implementation.....	5
E.1. The Change Will Not Injure River Water Rights.....	5
E.2. Project Effect of MODFLOW Water levels.....	5-6
E.3. Project Effect on City of Hailey.....	6
E.4. Watermaster Concurrence.....	6
F. Criteria for IDWR Application Approval.....	6-7

List of Tables

Table 1.	Flying Heart Ranch Water Rights.....	3
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List of Figures

- Figure 1. Flying Heart Ranch Spring Discharge
- Figure 2. Flying Heart Ranch Aerial
- Figure 3. Photo of Fire Suppression Well #2
- Figure 4. Simulated Effect of Pumping Year Round
- Figure 5. Simulated Effect of Pumping during Irrigation Season
- Figure 6. Groundwater Level Change Due to Stream Enhancement Wells
- Figure 7. Simulated Pumping Contour Maps
- Figure 8. Simulated Drawdown During Irrigation Season-Northridge Well

Appendices

Appendix A. Exhibit 1 Big Wood River Aquifer Model Showing Gaining Reach

Appendix B. Larry Schoen Flying Heart Subdivision Memo

Expert Report and Narrative Relative to Impact of Proposed Plan by Flying Heart Ranch Owners Association (FHROA) for Spring Flow Enhancement

Prepared by: Brockway Engineering, PLLC
Date: November 26, 2014

A. Summary

Flying Heart Ranch Owners Association proposes to restore the natural streams on the subdivision and restore the historical fishery migration from the Big Wood River. Successful restoration requires additional flow in the streams to replace the declines which have occurred so an application for a water right (37-22876) for additional groundwater from 3 existing wells has been submitted requesting to restore flows to the historical permitted amounts.

Implementation of the proposed water right will provide fresh, cold water to the historical streams and provide spawning habitat for Big Wood River trout via the return flow to the river through the existing channel on the Parry Thomas property.

Because the water pumped from the aquifer will return to the Big Wood River at the south end of the subdivision, there will be no significant impact on the flow in the Big Wood River. Drawdown in the aquifer will occur at the pumped wells, decrease at distances from the wells but will return quickly when pumping ceases. Drawdown at the City of Hailey Northridge well will exhibit a maximum drawdown of less than 2 inches.

The proposed permit application meets all IDWR criteria for approval including local public interest. The water amenities on the subdivision have not been managed in the past and the members have committed to a Management Plan for the future.

B. Background

This report addresses the particulars of the plan by Flying Heart HOA for rehabilitation of streams and water amenities on the subdivision and the application for Water Right Permit 37- 22876 filed by Flying Heart Ranch Homeowners to supplement declining spring flows and enhance habitat and fish passage.

The applicants have filed the application for Permit 37- 22876 in order to secure a

ground water supply to provide water to mitigate declines in the springs which supply water for the Flying Heart Subdivision aesthetic, recreational, and wildlife facilities. Flows in the three major springs providing water under water right 37-7767 to the ponds and measured spring inflow streams have declined to as low as 3 cfs as compared to the decreed flow of 10 cfs in the last 20 years, (Figure 1 shows historical flows at the outlet of the upper, Purdum Pond). The permit requests flows of up to 10 cfs as needed which is the permitted discharge under water right 37-7767. Historical discharge shown in Figure 1 from the upper pond is less than measured inflow indicating that the upper pond does leak.

The application requests to discharge from three existing wells, currently utilized for fire suppression within the subdivision, see Figure 2. These three existing wells would be utilized for spring flow enhancement as needed in addition to fire suppression. The utilization of the three wells for the additional use has been reviewed and approved by the Wood River Fire Protection District.

Renovation of the hydraulics and environment of the spring fed streams and upper pond on the subdivision (Purdum Pond) will be improved and the lower pond open water area as well as the wetlands will be reduced. The additional flow in the outlet stream through the Parry Thomas property (Figure 2) will enhance the return flow to the Big Wood River and provide adequate discharge to restore trout migration from the river upstream to the Purdum pond and headwater streams.

B.1.Stream and Pond System Water Source

The stream and pond system on the Flying Heart Ranch is fed from at least three springs and has historically provided at least 10 cfs of flow from the springs which is the discharge allowed by water right 37-7767. These streams are perennial but discharge varies seasonally as influenced by the Big Wood River stage and water use within the Big Wood River aquifer. The streams from the springs authorized to be diverted under water right 37-7767 are considered by the Idaho Department of Water Resources as surface water and as part of the Big Wood River. Enhancement of the flow of the springs under the existing water right for Flying Hear Ranch by modification of the spring orifice or outlet is not allowed by IDWR because any hydraulic modification of the spring head would be acquisition of ground water as opposed to surface water. Therefore, the application for permit 37- 22876 is considered ground water and requires a new permit. Enhancement of the spring fed streams with additional ground water is desirable as opposed to diversion of Big Wood River water because of the better water quality, lower temperatures, and smaller quantities of sediment associated with diversions from ground water.

B.2. History of Development

The stream system on the Flying Heart Ranch was formerly called the Purdum Slough and the upper pond on the subdivision was owned by Mr. Purdum who obtained a water right to harvest ice from the pond in the winter time. The flow from the Purdum pond was diverted to ditches for irrigation of lands downstream of the property through structures which are still present at the upper pond. Water rights, primarily for irrigation,

utilizing Purdum Slough water were codified in a 1922 Decree called the Warr decree. The irrigated lands included areas on the subdivision and south as far as the City of Hailey.

B.3. Flying Heart Ranch Water Rights

Flying Heart Ranch owns three (3) water rights with designated points of diversion on the Flying Heart Ranch subdivision. Points of diversion for all of the above water rights are part of the stream complex issuing from the Big Wood River aquifer. Table 1 shows the Flying Heart Ranch water rights currently on the IDWR data base (November 19, 2014).

Table 1. Flying Heart Ranch Water Rights

Number	Priority	Source	Use	Diversion Point	Discharge or Volume	Place of Use	Limitation
37-11828	5/15/1884	Unnamed Stream	Storage, recreation & aesthetic	NENE Sec 5	11.2 AFA. Upper Pond	NENE,NW NE Sec 5	Facility Volume 18.8 af
37-7767	2/27/1979	Springs	Recreation (fishing)	SWSE Sec 32	10 cfs	NENE,NW NE SENE Sec 5	820,000ft ³
37-8429	10/20/1988	Ground Water	Irrig., dom., fire protection	NENE Sec 5	1.18 cfs	SWNW Sec 4 NENE,NW NE, SENE Sec 5	20 acres and 70af irrig 16homes 9.6 af dom

C. Application for Permit 37-22876

The stated purpose of this Permit Application is to insure a secure water source from the Big Wood River Aquifer to provide an adequate supply of clean, cool water for benthic and riparian environment improvement for streams and ponds on the Flying Heart Subdivision and for fish migration from the Big Wood River to the waterways on the subdivision. This application was submitted in response to decreases in natural flow from historical springs on the property. This permit does not propose to change the nature of use of currently developed waters under the non-consumptive water right 37-7767, or for changes in use under water rights 37-11828 or 37-8429 which are owned by FHROA.

C.1. Water Source

The Purdum Slough on the Flying Heart Subdivision currently consists of a group of springs in T.3N R.18E Sections 5 and 32. The major points of diversion listed on the IDWR shp. file for water right 37-7767 are shown as "springs" on Figure 2. The Purdum Slough on the Flying Heart subdivision historically also received water from the Big Wood River through an extension of the current Purdum Slough channel which diverts from the Big Wood River upstream of the Deer Creek confluence. The Upper Purdum Slough channel has subsequently been diverted back to the Big Wood River north of the

Flying Heart Subdivision and the only source of water in the channels on the subdivision is from springs emanating from the shallow aquifer.

Application for permit 37-22876 requests ground water diversion from existing fire suppression wells which are within the same 10 acres subdivisions as the permitted points of diversion listed in water right 37-7767(Figure 2).

C.2. Description of Proposed Points of Diversion

The three (3) proposed points of diversion listed on permit 37-22876 are three (3) existing wells located around the subdivision adjacent to the Aspen Lakes Drive and operated by the FHROA. The wells range from about 40 ft. to 120 feet deep and were pump tested in the summer of 2014 to determine the current yield and to provide data to estimate aquifer properties. The location of the three wells designated for points of diversion under the permit application are shown on Figure 2. The north well (#1) provided a discharge of about 560 gpm with a drawdown of 11 feet after 7 hours of pumping. Well #2 (Mistic well) provided a discharge of about 520 gpm with a drawdown of 8 feet after 5 hours of pumping. Well #3 (Willis well) provided a discharge of about 590 gpm with a drawdown of 10.8 feet after 6 hours of pumping. As necessary, the flow from each of the modified fire suppression wells can be enhanced by adding additional horsepower or deepening each well. Figure 3 shows a photograph of fire suppression well #2 during pump testing.

The wells will be pumped as necessary to provide discharge in the channels and pond to provide adequate flow for fish and aquatic habitat and in no case will the total discharge from the wells plus the spring flows exceed the discharge allowed under water right 37-7767 of 10 cfs. It is likely that the total diversion required under the proposed permit would range from 6 to 10 cfs.

D. Water will be Delivered to the Existing Channels from the Wells by Buried Pipelines or Open Channels

The water pumped from each of the wells will be delivered through buried pipelines to the closest stream or pond. There will be no appreciable loss in the delivery system to the streams or pond. The total flow will enter the system and be delivered to the Big Wood River at a point approximately 1200 feet downstream or south of the subdivision (Figure 2). The total discharge leaving the upper (Purdum) pond will be measured at the current weir at the outlet of the upper pond which is monitored by the District 37 Watermaster. Each well will be equipped with an IDWR approved discharge measuring device.

E. Evaluation of Permit Implementation

E.1. The Change Will Not Injure River Water Rights

The Big Wood River is a gaining reach (water from the aquifer feeds the river) from Ketchum downstream to Hailey. The aerial photograph of the Big Wood River valley shown in Appendix A shows the reaches in yellow color where the river gains discharge. A memorandum to Chairman Larry Schoen of the Blaine County Commissioners outlines the Flying Heart Homeowners Association plan and evaluation of the impact of the proposed project on the Big Wood River (Appendix B). The proposed diversion of non- consumptive water from the aquifer will temporarily decrease the flow of water in the Big Wood River along the west side of the subdivision downstream approximately 1200 feet to the point where the surface flow of the pumped water returns to the river. The nearest discharge measurement of the Big Wood River is at the Hailey USGS gauge, approximately 5700 ft. (1.08 miles) downstream. In order to determine the impact of the Flying Heart Ranch project, Brockway Engineering utilized a ground water flow model based on the MODFLOW USGS code which has been used on several projects and has been reviewed by IDWR. This model was utilized to simulate the pumping of the three wells proposed in the FHR project. Figure 4 shows the results of the simulation of continuous pumping of six (6) cfs from the three proposed wells (2 cfs/well) with a surface return to the Big Wood River of 80% (4.8 cfs). It was assumed that the 1.2 cfs (6.0-4.8 cfs) would constitute seepage and would not be available to return to the Big Wood River. Figure 4 shows a plot of simulated decrease in river flow during stabilized continuous pumping if no water is returned to the Big Wood River. The return of 4.8 cfs to the river just downstream of the subdivision replaces the reduction in river flow due to pumping and the net effect of the project is positive (center line, Figure 4). There are no authorized diversions from the Big Wood River in the reach bordering the subdivision, so there is no injury to any surface water right diversion as a result of the project. If pumping occurs only during the irrigation season, April 15 to November 15, or 7 months, there will be a short period after the end of well pumping (Nov. 15 to about December 15) when there will be a net decrease in river flow due to the time lag of the aquifer response and the shut off of return flow to the river as shown in Figure 5.

E.2. Project Effect on MODFLOW Water levels

Aquifer water levels within the Flying Heart subdivision will decrease during well pumping for the project. The ground water model was utilized to simulate the effect of pumping a total of 6 cfs from the three proposed wells for a period of 7 months each year. Figure 6 shows the response of the aquifer water level at each of the wells for three consecutive years of pumping. The water level becomes a maximum of 3.2 feet lower at well #1 and #2 and slightly less than 3 feet in #3 and returns to the pre-pumping level at the end of the pumping period. Figure 6 depicts the simulated drawdown of the water level in the aquifer at the wells only.

The ground water model was also utilized to simulate and depict graphically the water table response to pumping throughout the subdivision. Figure 7 shows the contours of water table drawdown across the valley as a response from pumping a total of 6 cfs for

7 months. The contours shown in Figure 7 depict the drawdown at the end of the 7 month pumping period. Contours on the drawdown for continuous pumping are nearly the same magnitude since the hydraulic conductivity of the aquifer is large and the valley is narrow. Figure 7 shows that the draw down of aquifer water levels due to pumping varies from a maximum of 3.2 cfs at Well #1 to 0.5 cfs about 1.5 miles from the center of the subdivision for pumping of 6 cfs for 7 months. If the pumping rate is increased from 6 cfs to 10 cfs for the 7 month period, the simulated drawdown increases. For instance, the drawdown contour on Figure 6 for 6.0 cfs pumping for 7 months increases from 3.3 ft to approximately 5.33 for pumping of 10 cfs for 7 months which is almost a linear relationship between discharge and drawdown.

E.3. Project Effect on City of Hailey Northridge Well Water Level

Concern has been expressed about the possible impacts of the FHR project on ground water levels at the City of Hailey Northridge well. Figure 7 shows the location of the City of Hailey Northridge well with respect to the FHR subdivision and proposed stream enhancement wells. The average distance from the FHR wells to the Northridge well is 5600 feet (Figure 7). The ground water model was utilized to estimate the impact of the various pumping scenarios on the water level at the Northridge well. Figure 8 shows the simulated impact of pumping the 3 wells at the FHR at 6 cfs for each year for 7 months for each year for three consecutive years. The maximum drawdown occurs in October with this scenario and the response is repetitive every year. The maximum yearly decline in the Northridge well water level is 0.15 feet (1.8 inches) which would occur in October of each year after the irrigation season.

E.4. Watermaster Concurrence

The Watermaster of Water District 37, Kevan Lakey, who has jurisdiction over the water administration of the Flying Heart system, has indicated that he approves the project but has expressed concern that additional consumptive use may occur by introduction of more water into the system. This is based on the observations that the lower pond (Willis pond) has not normally filled in the near past and more water in the system would provide more open-water in the system and thus more consumptive use. The plan for restoration of the channel/pond system includes elimination of the open water in the Willis pond and replacement with two narrow channels from the Purdum pond to the outlet at the south end of the subdivision and development of wetlands within the area of the Willis pond as shown on Figure 2. In addition, the beaver dams above the Purdum pond have been removed and the channels narrowed. These changes will all result in reductions in the system's open water surface and consumptive use.

G. Criteria for IDWR Permit Application Approval

The application for permit 37-27876 meets all of the criteria for approval as outlined in the Idaho Code, 42-203A (5).

1. There will be no reduction in the quantity of water available under existing water rights. With the non-consumptive nature of the water use and return of water to the Big

Wood River, there will be no net impact to the Big Wood River downstream of the project.

2. The water supply is sufficient for the purpose for which it is sought to be appropriated. The water supply in the aquifer is adequate and aquifer properties will support the intended pumping.

3. The application is made in good faith and is not made for delay or speculative purposes.

4. The applicant has sufficient financial resources to complete the work. The Flying Heart Ranch Owners Association includes members who have approved the project and have sufficient collective financial ability to complete the project.

5. The project as proposed will not conflict with the local public interest as defined in section 42-202B, Idaho Code. Section 42-202B defines local public interest as "the interests that the people in the area directly affected by a proposed water use have in the effects of such use on the public water resource". The project, if implemented, will improve the fishery in the streams traversing the subdivision and conveying the increased water to the Big Wood River. This will provide additional spawning habitat and enhance the contribution of this tributary to the general fishery of the Big Wood River. Removal of significant open water area from the watershed will decrease breeding ground for mosquitos and thereby provide a benefit to the local area. Increased flow in the project streams provides better water quality both for fish health and for recreational and aesthetic benefits.

6. The project is not contrary to the conservation of water resources within the State of Idaho. This project does not result in excessive waste water generation. It is non-consumptive in that no beneficial use that is considered consumptive is contemplated. Water pumped from the aquifer is returned to the Big Wood River and no water is transported outside the watershed.

7. The project will not adversely affect the local economy.

This application for permit 37-7767 meets all criteria for approval as outlined in the Idaho Code. The biological, hydraulic, and recreational benefits to the members of the subdivision and to the public are a good example of efficient use of the water resource and a good example of water right owners unilaterally enhancing their own system to remedy a problem.

Historical land and water management on the subdivision has not been adequate. It is significant that the Flying Heart Ranch Owners have agreed to develop and implement a Water Management Plan for the subdivision to manage and maintain the improved stream and pond system.

Figure 1
Flying Heart Ranch Spring Discharge

Figure 1 Flying Heart Ranch Spring Discharge

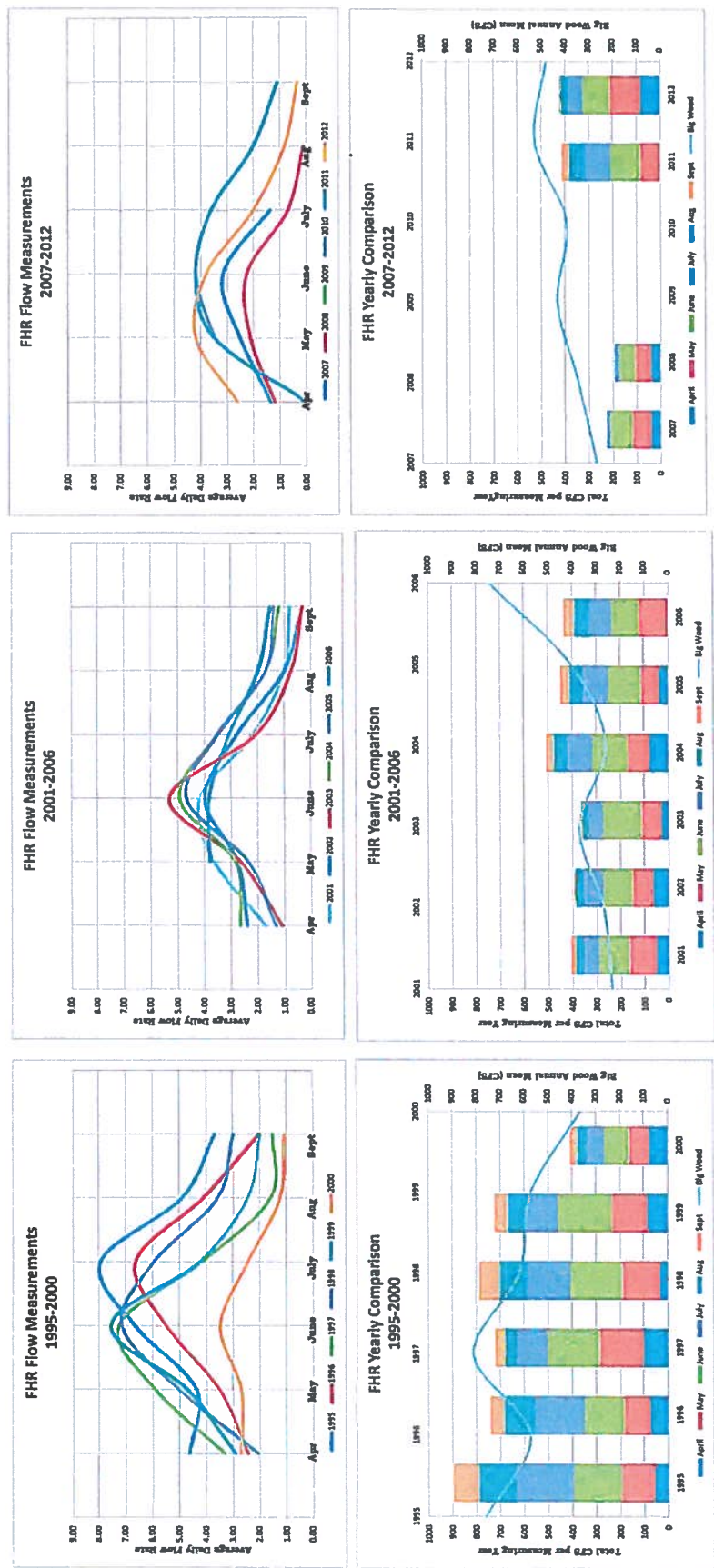
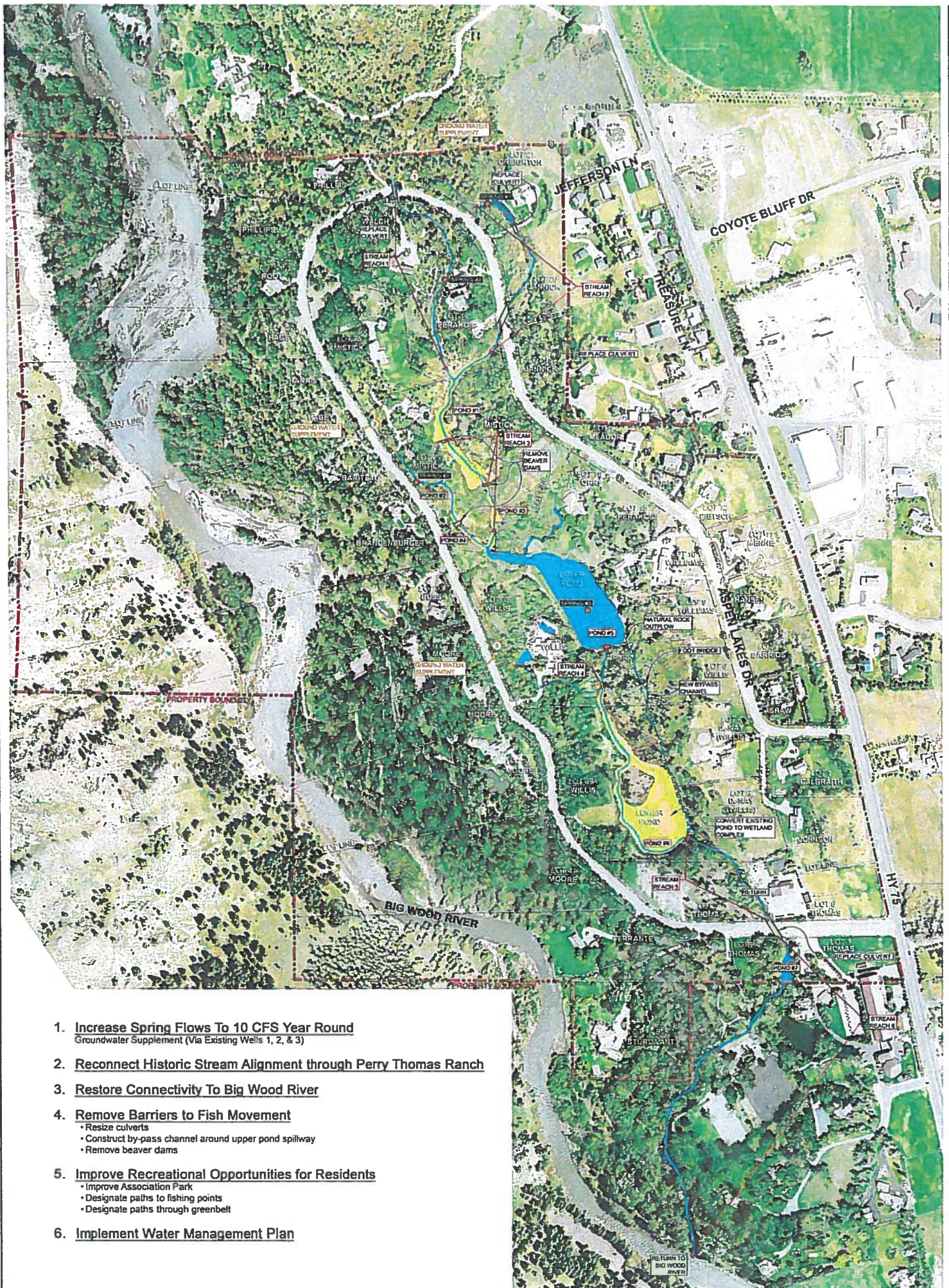


Figure 2
Flying Heart Ranch Aerial



1. **Increase Spring Flows To 10 CFS Year Round**
Groundwater Supplement (Via Existing Wells 1, 2, & 3)
2. **Reconnect Historic Stream Alignment through Perry Thomas Ranch**
3. **Restore Connectivity To Big Wood River**
4. **Remove Barriers to Fish Movement**
 - Resize culverts
 - Construct by-pass channel around upper pond spillway
 - Remove beaver dams
5. **Improve Recreational Opportunities for Residents**
 - Improve Association Park
 - Designate paths to fishing points
 - Designate paths through greenbelt
6. **Implement Water Management Plan**

Figure 3

Photo of Fire Suppression Well #2



Figure 4
Simulated Effect of Pumping Year Round

Simulated Effect of Flying Heart Project Pumping 6 cfs Year Round on Big Wood River Above Hailey

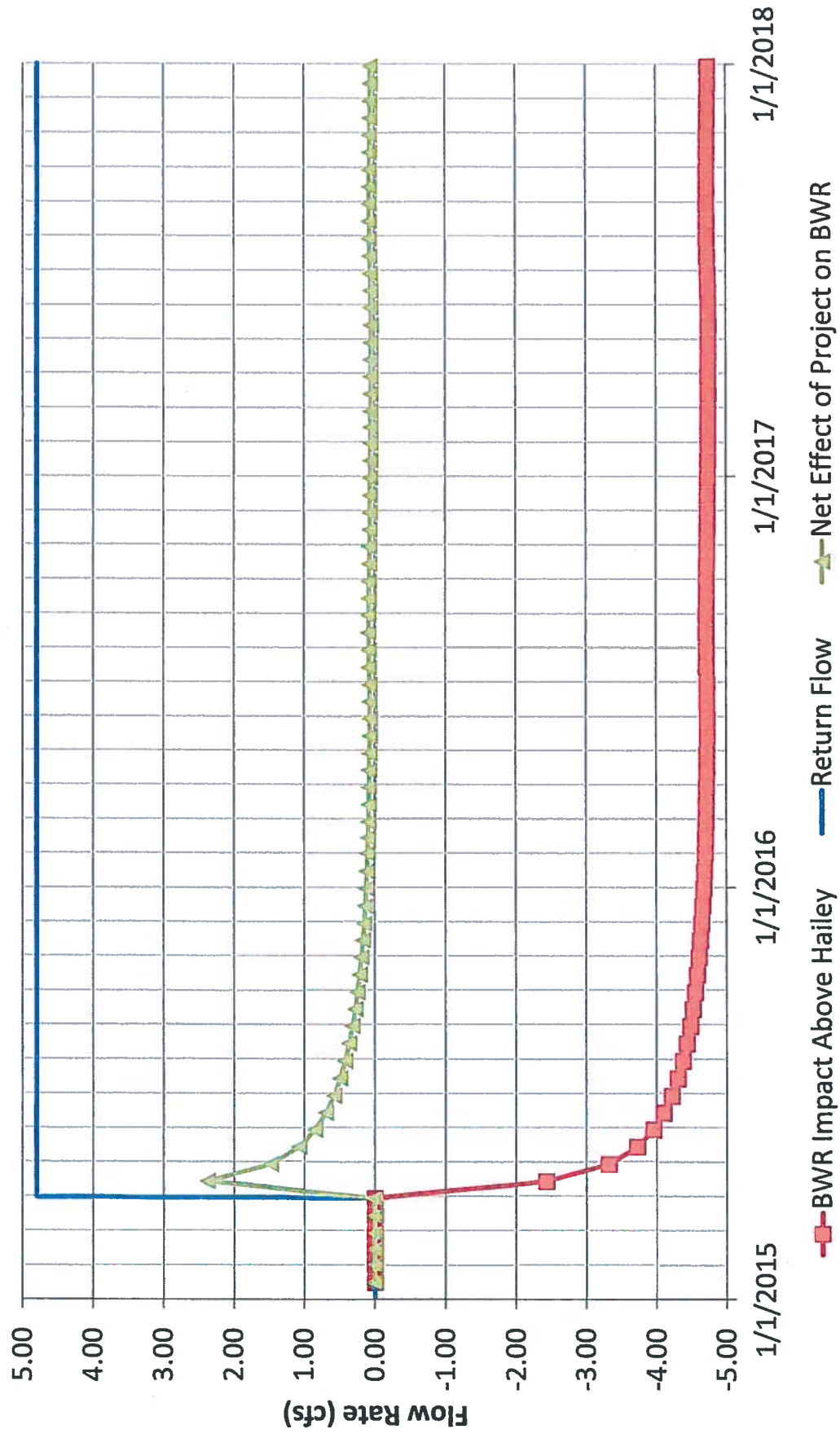


Figure 5
Simulated Effect of Pumping during Irrigation Season

Simulated Effect of Flying Heart Project Pumping 6 cfs During Irrigation Season on Big Wood River Above Hailey

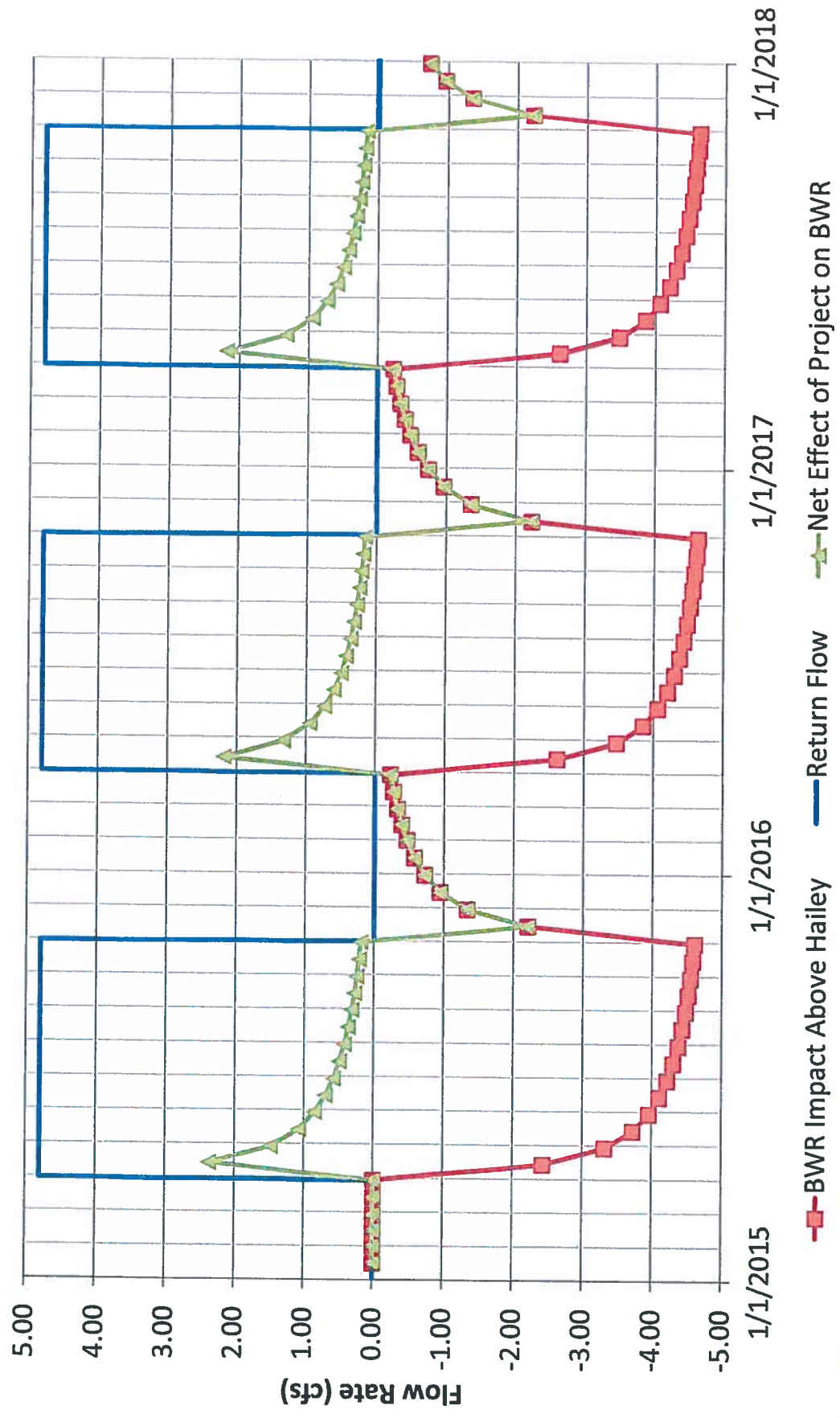


Figure 6
Groundwater Level Change Due to Stream Enhancement Wells

Flying Heart Ranch Groundwater Level Change Due to Stream Enhancement Wells Pumping 6 cfs During Irrigation Season

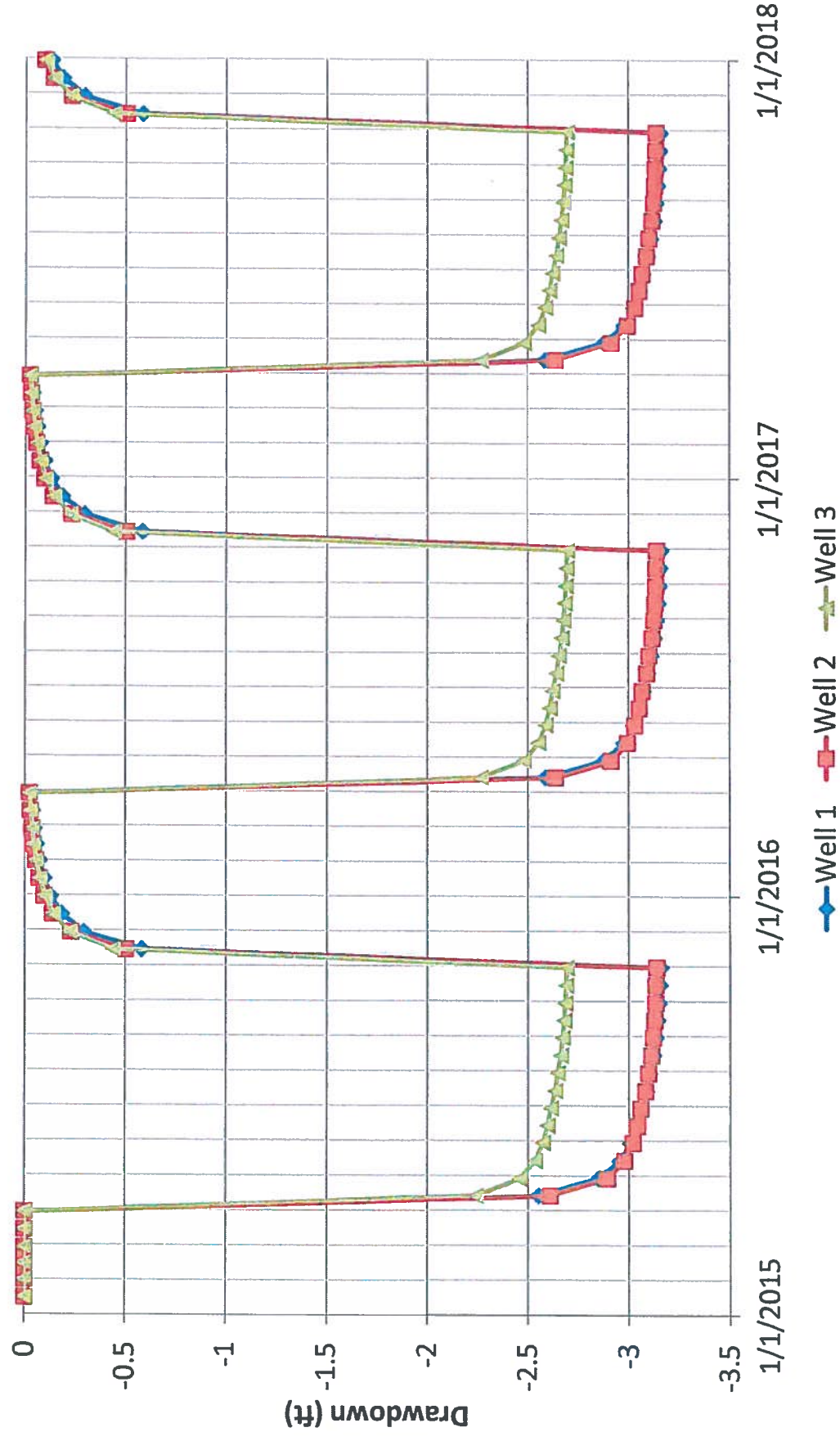
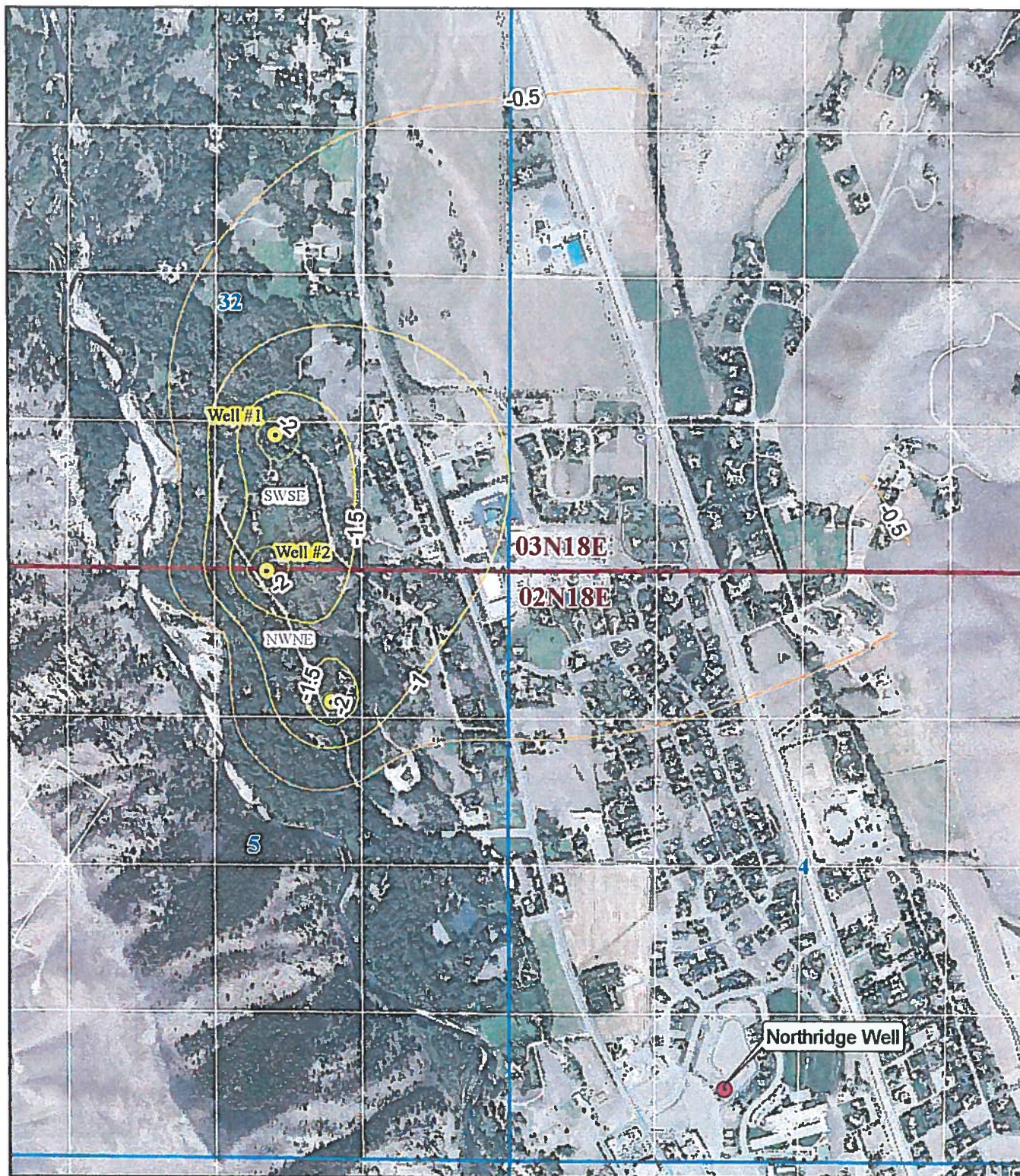


Figure 7
Simulated Pumping Contour Maps



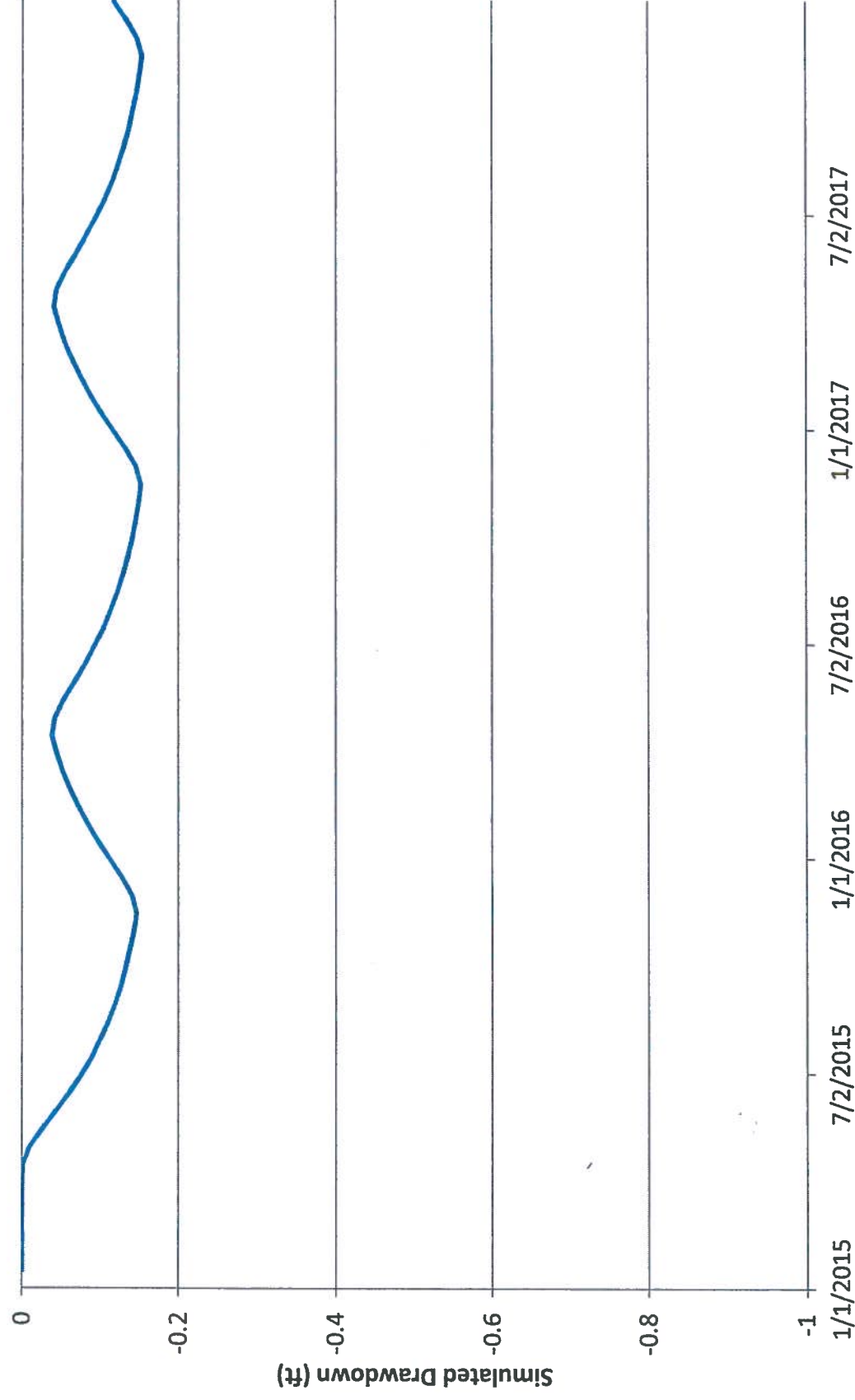
**SIMULATED FLYING HEART SUBDIVISION PROJECT
PUMPING 6 CFS DURING THE IRRIGATION SEASON
BROCKWAY BIG WOOD MODFLOW MODEL, 2008**

Legend

- | | | | | | |
|--|-----------------------------------|--|-------------------|--|----------------|
| | Northridge Well | | Contours6_7m_arcs | | Township/Range |
| | Well_Sites_for_Spring_Restoration | | -2 | | Sections |
| | | | -1.5 | | QQ |
| | | | -1 | | |
| | | | -0.5 | | |

Figure 8
Simulated Drawdown during Irrigation Season
Hailey Northridge Well

Simulated Effect of Flying Heart Project Pumping 6 cfs During Irrigation Season Drawdown City of HaileyNorthridge Well



Appendix A
FHS Big Wood River Aquifer Model Aerial
Showing Gaining Reach



1 in = 5,000 ft

BROCKWAY ENGINEERING, PLLC
GEP - SEPT 11, 2014

EXHIBIT 1
FLYING HEART SUBDIVISION
BIG WOOD RIVER REACH GAINS
BIG WOOD RIVER AQUIFER MODEL
NAIP 2013 AERIAL PHOTOGRAPHY

Legend

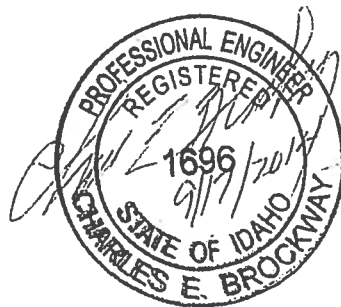
● BWR Reach Gains

Appendix B
Schoen Memo



Memo

To: Larry Schoen, Blaine County Commissioner
From: Charles E. Brockway, P.E. PhD.
Cc:
Date: 9/17/14
Re: Flying Heart Subdivision



At the recent meeting of the Blaine County Commissioners on August 12th at which you and Commissioner Greenberg were present, you indicated that you believe that the extraction of additional ground water at Flying Heart Subdivision would decrease the flow of the Big Wood River at the Hailey USGS gauge.

I indicated that our firm strongly supports that pumping up to 10 CFS of shallow ground water that would return to the Big Wood River through the Flying Heart Ranch cold springs and pond system would not decrease the discharge at the Hailey gauge because the shallow aquifer is tributary to (feeds) the Big Wood River for nearly the entire reach between the Subdivision and the Hailey gauge. This memorandum provides you with the data to show that that is in fact the case.

In connection with recently approved ground water recharge permits obtained by Dry Lot, LLC on the Valley Club Homeowners Association project and the Valley Club Golf Course. Brockway Engineering, PLLC developed a ground water model of the Big Wood River and the Wood River Valley aquifer covering the area from East Fork downstream to Bellevue. The model simulates the aquifer-river relationships and estimates the reaches of the river where the aquifer is tributary to the river and where the river is tributary to the aquifer. Exhibit 1 attached shows (in blue) where the shallow aquifer 'feeds' the river. Note that the aquifer feeds the river from Deer Creek downstream for nearly the entire reach. This indicates that the river is 'gaining' water from the aquifer naturally and the river discharge is greater normally at the Hailey gauge than it is above the Flying Heart Subdivision. Studies by the University of Idaho and the USGS indicate the same result. A 1989 study by the USGS shows measured Big Wood River reach gain between East Fork and Hailey of 36 CFS (Water Resources of the Upper Big Wood River Basin, by S.A. Frenzel, USGS Water-Resources Investigations Report 89-4018).

A 1984 study by the University of Idaho indicates a similar result. This study shows measured Big Wood River reach gain between Deer Creek and Hailey of 86 CFS (Table 5 and Figures 29 and 30 of the report "Impacts of Individual On-Site Sewage Disposal Facilities on Mountain Valleys by S.P. Luttrell and C.E. Brockway"). These studies indicate that the Big Wood River upstream of the Hailey gauge is a gaining reach and the aquifer feeds the river.

A recent report by the USGS ("Stream Seepage and Groundwater Levels, Wood River Valley, South-Central Idaho 2012-13, Scientific Investigations Report 2014-5151") documents the

measured Big Wood River/aquifer relationships relative to reach gains. Gains and losses in the Big Wood River were measured three times during the study starting at the USGS station at Big Wood River near Ketchum which is near the North Fork and ending downstream at the Big Wood River at Stanton Crossing. This report shows that the Big Wood River from Gimlet to the Big Wood River at Hailey had measured gains during two times that it was measured and a zero gain during a third measurement. Table 1 shows the data from Tables A1, A2 and A3 of the USGS study for the three measurement times for the reach of Big Wood River from Gimlet (Station B04) to Hailey (Station B05).

Table 1: Reach-gains in the Big Wood River from Gimlet to Hailey –USGS 2014

Date	Gain+ or Loss CFS
August 27-28, 2012	0
October 22-23, 2012	+7.5
March 27-28, 2013	+25

The USGS concluded that “The Big Wood River generally gains flow between the Big Wood River near the Ketchum stream gauge (13135500), and the Big Wood River at Hailey stream gauge (13139510), and loses flow between the Hailey stream gauge and the Big Wood River at Stanton Crossing near Bellevue stream gauge (13140800). This spatial pattern of gaining and losing stream reaches was reasonable and consistent throughout all three of the seasonal seepage investigations.”

The ground water model study by Brockway Engineering, PLLC performed for Dry Lot, LLC and for The Valley Club shows also that the Big Wood River is a gaining reach above the Hailey gauge and in particular in the reach adjacent to the Flying Heart Subdivision. This same model, reviewed and approved by IDWR, was used to model the effects of the diversion of groundwater at three proposed existing well sites as designated in the Flying Heart Subdivision application. The model analysis shows that extraction of 10 CFS of groundwater at the three sites (3.33 CFS at each of three sites) results in a decrease of underground discharge from the aquifer to the river in the reach adjacent to Flying Heart (Deer Creek to Aspen Lake Drive) of 7.42 CFS with smaller decreases in the reaches upstream and downstream of the subdivision. In total, maximum continuous pumping at the three sites results in an 8.97 CFS decrease in reach gain from the Starweather bridge downstream to the Bullion Street gauge (Hailey USGS gauge). All groundwater pumped under the proposed project is conveyed through the surface stream of the subdivision and back to the Big Wood River at a point approximately 5700 ft. (1.08 miles) upstream of the Hailey USGS gauge. Therefore, there will be no decrease in flow at the Hailey gauge due to the proposed ground water pumping. Likewise, there are no authorized diversions from the Big Wood River in the reach from the Perry Thomas diversion downstream to the Hailey gauge, so there is no interference with existing water right diversions in that reach.

The planned rehabilitation of the streams within the Flying Heart Ranch subdivision contemplates the removal of two large beaver dams, reduction in the width of streams and wetland fringes, and conversion of the area of the lower pond (see attached aerial photo, Exhibit 2). This reduction in open water area results in a significant reduction in the evaporation from

open water surfaces and wetlands and therefore a reduction in total water loss through the system, Table 2. The upper pond (Purdum pond) area is not affected since the water level is controlled by the outlet structure and the open water surface does not change. The open water evaporation was calculated utilizing GIS procedures and current (2014) and proposed (after project) aerial photos. Evapotranspiration data for the Hailey Ranger Station published by the University of Idaho (*ET_{Idaho} 2012 -- Evapotranspiration and Consumptive Irrigation Water Requirements for Idaho*) was utilized to calculate evapotranspiration for open water surfaces and wetlands areas.

Table 2: Flying Heart Subdivision-Stream System Rehab: Water Budget within Stream Corridor

Component	Current Area * acres	Evapotranspiration mm/day (maximum month)	Evapotranspiration acre feet/day	Evapotranspiration CFS
Open Water before	6.8	4.32	0.096	0.049
Wetlands before*	0	6.01	0.000	0.000
Total before	6.8	4.32	0.096	0.049
Open Water after	4	4.32	0.057	0.029
New Wetlands after*	1.7	6.01	0.034	0.017
Uplands after	1.1			
Total after	6.8		0.091	0.046
Difference	0		0.005	-0.003

*Data from Will Miller

Table 2 shows that the decrease in evaporation loss within the stream corridor is equal to 0.005 acre feet/day or 0.003 CFS based on maximum daily average evaporation or a reduction of six (6) percent from the historical evaporation loss. With the decrease in evaporation loss within the stream corridor and return of up to 10 CFS of water to the stream/pond system, the reduced area of the lower streams will remain full and losses will be provided from the existing water right as they have been in the past. The added water will pass through to the Big Wood River. This increased flow to the river will once again provide fish passage from the Big Wood River through the subdivision to spawning areas in the headwaters within the Flying Heart Ranch subdivision.

Jack Bariteau, Board Member of the Flying Heart Ranch Owners Association (“FHROA”) and Will Miller are available to meet you onsite within Flying Heart Ranch and walk you through the plan for the recharging and evaporative pond areas planned to be significantly reduced once the permit application is approved by IDWR.

Memorandum

November 26, 2014

To: Blaine County Board of Commissioners Jacob Greenberg, Angenie McCleary and Larry Schoen

From: Jack Bariteau, President of the Board of Directors, Flying Heart Ranch Owners Association

RE: Flying Heart Ranch: A Rich History and Irreplaceable Cold Springs

Flying Heart Ranch today is a 47 property subdivision that sits just off of Highway 75 less than one mile north of the Hailey city limits. The subdivision was created by several local investors and sponsors led by Wayne Roth who purchased the ranch from the Valentine family in the mid 1970's. Focal points of the development were the spring creek and pond system that flowed unimpeded through the heart of the development connecting to the Big Wood River at the south end of River Grove Farm and the meandering frontage of the Big Wood on the western side of the ranch. Home to many varied long term permanent and second home and property owners of the Wood River Valley, Flying Heart Ranch is bounded on the south by River Grove Farm, one of the finest equestrian facilities in the Northwest; Highway 75 to the east; the Big Wood River to the west and the former Purdum slough to the north. Flying Heart Ranch is accessed at two points along Highway 75 via Aspen Lakes Drive, the 1.7 mile privately maintained road built to provide ingress and egress to the homes and still undeveloped home sites within the subdivision.

Originally created out of ranchland settled and operated by the Purdum family, the ranch is notable for its overall riparian features and the unique presence of four well known spring creek cold springs that find their way to the surface at various locations within the ranch. The cold springs that surface here meander southward in small streams through the upper reaches of Flying Heart Ranch into a large natural pond known to many locals as the Purdom ice pond. The cold springs waters that fill and flow through the Purdom pond were once said to be "gin clear". Once through the Purdom pond head gate, the waters flow into the south pond. The south pond was created out of a swampy area that had been created and gradually diminished by the presence of beavers and their dams according to Wayne Roth. Mr. Roth indicated that the efforts to clear the beaver dams and create this southerly pond were extensively reviewed and approved by IDWR. Prior to the water master locking off the hand wheel and head gate at the south end of the lower pond in 2012, the waters in this newly created pond had flowed via a pipe culvert under Aspen Lakes Drive and into the River Grove Farm stream and pond system eventually rejoining the Big Wood River. This connection to the Big Wood provided a natural

highway for the native Rainbow and Cutt-bow trout of the Big Wood in finding safe harbor in the 43 degree cold springs waters which are unique to Flying Heart Ranch.

Today, the Flying Heart Ranch cold springs stream system is suffering from years of neglect, beaver intrusion, siltation and over time inaction by the homeowner association that owns the water resource and that is responsible for its long term health. The stream system has deteriorated due to a decrease in spring flows exacerbated changes in the Big Wood River, upstream diversions, the invasion of beavers and their inherent dam building and significant siltation buildup behind these dams. The homeowner association's failure to adopt a water management plan for its Association owned water resource in 2006 has also led inadvertently to this deterioration. Recognizing that the resource was being lost, the Association and its Board of Directors retained Chuck Brockway of Brockway Engineers and Will Miller of Will Miller Consulting in 2013 to review the various options for stream and habitat restoration. This work effort is the basis for the application to IDWR for approval of the use of our existing fire suppression well system to bring below surface water up and into the spring creek system allowing these waters to eventually reconnect to the Big Wood River without degradation or damage to the overall water resource.

Fishing in the Purdum pond was a truly extraordinary experience according to several long term residents including Tom Drougas and Jim Holcomb. Tom and Jim, local real estate agents, have handled many property sales in the Ranch over the years and remember that the upper part of the stream system was much more of natural stream flow versus the beaver pond environment that had been allowed to develop over the last 15 years. Prior to the beaver entry into the Ranch, the streams and ponds supported an abundant fishery with large cruising fish visible from the homes and pathways nearest the water. Expansion of the water surface area behind the beaver dams slowed the water flows increasing water temperatures and depleting the cooler temperature habitat necessary for the fishery to thrive. Siltation increased causing further damage to the system. Most recently, the new owners of the properties that front on the major beaver pond areas, Tom and Amy Mistick, working with Will Miller have embarked on breaching the beaver dams after the removal of the beavers from these ponds by the previous owner in 2013. The pond areas have been reduced significantly with natural stream channels now reappearing and gaining foundation. This effort is in keeping with the Association's goal of restoring our water resource to its most native condition.

Our IDWR water application legal counsel, Gary Slette, recently provided the Board with his 92 year old Mother's remembrance of fishing in the Purdum pond. Bea and her husband were visiting Gary who was at the time serving as the Blaine County Planning Administrator. After a trip to the Salmon River, they were invited to fish in Flying Heart Ranch. She recounts "Then we got to go fishing on that little pond..... was that ever fun!!! Those fish just could not wait until we dropped another line in the water. We had never had fish that were so eager to grab our hook. We had gone with our friends a couple of times to northern Minnesota to fish for Walleyes but

sometimes you would sit for hours before you would get a nibble, so this was a really fun experience for us. Then we had the enjoyment of feasting on our catch. At that time I was still in my prime, late 50's, now I am 92 and some memories just stay with you."

In 2012, the cold springs connection into the Big Wood River through the Thomas property was cut off at the head gate of the south pond by the water master. The water master locked off the hand wheel at the head gate once the Thomas property began receiving up to 2.5 CFS of water directly pumped from the Big Wood River point of diversion right that was granted to the Thomas ownership by IDWR on December 7, 2011. Significant diminishment of the water flow to the River Grove Farm side of Aspen Lakes Drive under the Warr Ditch decree led to the application being filed in by Peter Sturdivant on behalf of Perry Thomas, owner of River Grove Farm, in August, 2008. IDWR granted this point of diversion to provide the Thomas property with the water flows that had been previously received from the Flying Heart Ranch water system and the Warr Ditch. A pumping station was installed on the Wood River and piping was run eastward into the north end of the River Grove Farm pond system. If the water flows can be restored from Flying Heart Ranch into the Thomas property, the water master will then monitor and measure these flows and only permit up to the 2.5 CFS maximum to be used whether from a restored Flying Heart Ranch system or from Thomas point of diversion but no more than 2.5CFS from both sources combined.

Today, the Association Board utilizing the expert detailed scientific analysis and advice of its professional consultants, has garnered the support of Peter Sturdivant, representing the Thomas/River Grove Farm interests, in our efforts to restore the connection of the Flying Heart Ranch spring creek system to the Big Wood River through the Thomas property.

Of the four cold springs that have been identified within Flying Heart Ranch, perhaps the most significant cold spring rises into the Purdum pond near its center and is readily visible to the naked eye from above the surface. Cold springs are a very rare commodity in the Wood River Valley area with few north of Hailey that historically are known to have a direct connection to the Big Wood River. Flying Heart Ranch is one and the other is to be found at the far west end of the Warm Springs tributary on the Rosemary Bogner property. Cold springs are a highly valued fish habitat resource providing 43 degrees of cool clear water as it comes out of the ground. Cold springs are also excellent sources of naturally pure and clear ice during the Winter season. The Purdum family harvested this ice from the Flying Heart Ranch by permit in the 1930's and 1940's. It was primarily purchased and used extensively by the Union Pacific Railroad for its new Sun Valley Lodge and Inn resort that opened to the public in 1936. This "gin clear" ice was an iconic feature of every cocktail made in the resort's bars until refrigeration was introduced at the resort.

The opportunity to restore the Flying Heart Ranch cold springs resource is at hand.

The benefit derived to Flying Heart Ranch through our Association's water resource restoration effort is obvious. We firmly believe that our restoration efforts will also greatly benefit those who use the Big Wood fishery and see this as an opportunity to bring back one of the Wood River Valley's most important cold springs resources. Our Association will perform the restoration efforts without the need for public funds. We strongly believe that our success will inure to the long term prospects of the Big Wood River fishery and habitat for years to come strengthening the Wood River Valley's reputation among the fishing visitor who contributes so significantly to the economy of our area. As Terry Ring of Silver Creek Outfitters so eloquently says, "The Big Wood is slowly becoming known as one of the most productive fisheries in the western United States. This Freestone fishery is what many veteran fly anglers would dream up if left to design their own fisheries".

We trust that the Blaine County Board of Commissioners will conclude that our comprehensive and extensively researched plan is a worthwhile and beneficial endeavor and agree to remove the County's protest to the Flying Heart Ranch Owners Association IDWR water restoration application in the near term. The Association is dedicated to seeing its mission through to conclusion. In response to the questions and concerns raised at the Board of Commissioners hearing on November 4, 2014, Brockway Associates has prepared a comprehensive document entitled "Expert Report and Narrative Relative to Impact of Proposed Plan by Flying Heart Ranch Owners Association ("FHROA") for Spring Flow Enhancement that will accompany this short history of the water resource in Flying Heart Ranch. This engineering report while technical in nature addresses in detail the impacts and benefits to be derived from approval of FHROA's application to IDWR. FHROA's scientific team led by Chuck Brockway and Will Miller is highly respected. These gentlemen's vast historical and extensive experience in water restoration planning and program implementation with environmentally positive results are highly visible today throughout the Wood River Valley.

Merritt, Allen

From: Lawrence Schoen [lschoen@co.blaine.id.us]
Sent: Wednesday, December 03, 2014 5:08 PM
To: Jack Bariteau
Cc: Merritt, Allen; Gary Slette; Charles E. Brockway; Tim Graves; Tom Bergin
Subject: RE: Flying Heart Application

All--

Here is a summary of conditions to be attached to any permit, as described today:

- a) priority date is date of application;
- b) no more than 10cfs will be permitted to flow through the Flying Heart system (unless natural flow exceeds 10cfs) as measured at the weir located at southeastern end of Upper Pond;
- c) well outflows each are measured by in-line flow measurement devices;
- d) IDWR retains authority to require mitigation of evaporative losses, per analysis;
- e) this right(s) shall be junior and subordinate to future water rights authorizing diversion and use of water from the Big Wood River and its tributaries, including groundwater, for consumptive uses, except that this right(s) shall not be subordinate to future water rights for similar wildlife, recreation and/or aesthetic uses;
- f) this right(s) shall be junior and subordinate to future minimum in-stream flow water rights that may be established for the Big Wood River and its tributaries.

All conditions still are subject to discussion and evaluation by Applicants group and Board of Commissioners at their December 9 hearing. (Condition (f) has been rejected summarily by Applicants.) County will communicate further with Applicants by Wednesday December 10. A tentative Hearing timeline has been established in the meantime. Please let me know if I have forgotten to include something.

Once again, my sincere thanks to everyone for your valuable time today.

With regards,
Larry

Lawrence Schoen
Blaine County Commissioner
206 First Avenue South
Hailey, Idaho 83333
Ph: 208-788-5500 x1124
Fx: 208-788-5569
E-mail: lschoen@co.blaine.id.us
Web: www.blainecounty.org

From: Jack Bariteau [mailto:jack@waypointsunvalley.com]
Sent: Wednesday, December 03, 2014 11:20 AM
To: Lawrence Schoen
Cc: Merritt, Allen; Gary Slette; Charles E. Brockway; mpietsch@MARKETRON.COM; Tim Graves; Robin Moore; Tom Bergin; Jenny Lovell
Subject: Re: Flying Heart Application

Thank you Larry. We will be at the conference and understand the road issue completely. Look forward to having a constructive conversation later today.

Jack

On Wed, Dec 3, 2014 at 10:43 AM, Lawrence Schoen <lschoen@co.blaine.id.us> wrote:

Hi All--

I've just left a voice message with Allen requesting that Tom, Tim and I attend the conference today at 2pm via telephone. This is because of the treacherous road conditions. Jack and team may wish to do the same, which is fine with us. Pls let Tom, Tim or me know soonest, or leave word with Jenny Lovell at 208-788-5500 x1111.

Many thanks for this accommodation.

With regards,

Larry

Lawrence Schoen

Blaine County Commissioner

206 First Avenue South

Hailey, Idaho 83333

Ph: 208-788-5500 x1124

Fx: 208-788-5569

E-mail: lschoen@co.blaine.id.us

Web: www.blainecounty.org

From: Jack Bariteau [<mailto:jack@waypointsunvalley.com>]

Sent: Wednesday, December 03, 2014 7:56 AM

To: Merritt, Allen

Cc: Gary Slette; Charles E. Brockway; mpietsch@MARKETRON.COM; Tim Graves; Robin Moore; Lawrence Schoen; Tom Bergin

Subject: Re: Flying Heart Application

Good morning Allen. I will be attending the meeting today in your office along with Gary Slette and Chuck Brockway at 2PM in your office. We have submitted the attached report that was generated to respond to questions and concerns that arose from our hearing with the Board of Commissioners that took place on November 4th in Hailey. I have also attached a brief history of Flying Heart Ranch and our cold springs resource for your review. We look forward to seeing you for the conference late today.

Jack Bariteau

Board President

Flying Heart Ranch Owners Association

On Wed, Nov 12, 2014 at 6:56 AM, Merritt, Allen <Allen.Merritt@idwr.idaho.gov> wrote:

Gentlemen,

In light of the apparent agreement of the parties to vacate the conference today and reschedule the pre-hearing conference to December 3 at 2 p.m. please accept this e-mail as the notice to accomplish this task.

As before if you wish to participate by phone.....

Phone call [215-446-0193](tel:215-446-0193)

Part code 675676#

I will look forward to the conference on Wednesday December 3 at 2:00 pm.

Allen Merritt

IDWR Southern Region Manager

From: Gary Slette [<mailto:gslette@rsidaholaw.com>]

Sent: Tuesday, November 11, 2014 8:36 AM

To: Merritt, Allen

Cc: Charles E. Brockway; mpietsch@MARKETRON.COM; 'Jack Bariteau'; Tim Graves; Robin Moore

Subject: RE: Flying Heart Application

Allen,

Good morning. Blaine County and the Flying Heart representatives met on November 4, and have expressed a desire to continue a dialogue. Please see the emails below. Would it be possible to vacate the pre-hearing conference scheduled

for tomorrow and reset it for Wednesday, December 3 at 2 p.m.? If that time is not convenient for you, I think we can work around it, but everyone seemed to be available on that one day. I hope the same is true for you!!

Thank you for your consideration. A Reply to All would probably be the best way to respond.

Regards,

Gary

From: Jack Bariteau [<mailto:jack@waypointsunvalley.com>]
Sent: Monday, November 10, 2014 4:21 PM
To: Tim Graves
Cc: Gary Slette; Charles E. Brockway; mpietsch@MARKETRON.COM
Subject: Re: Flying Heart Application

Thanks Tim. We will connect with Alan Merritt at IDWR to see if this will work for his schedule.

Jack

On Mon, Nov 10, 2014 at 2:22 PM, Tim Graves <tgraves@co.blaine.id.us> wrote:

The 3rd works for us. Preferably in the afternoon. 2pm would be ideal.

Timothy K. Graves

Chief Deputy Prosecuting Attorney

Blaine County Prosecuting Attorney's Office

219 First Avenue South, Suite 201

Hailey, ID 83333

(208) 788-5545

(208) 788-5554 (fax)

tgraves@co.blaine.id.us

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From: Gary Slette [mailto:gslette@rsidaholaw.com]
Sent: Monday, November 10, 2014 11:44 AM
To: Tim Graves
Cc: 'Jack Bariteau'; Charles E. Brockway; 'mpietsch@MARKETRON.COM'
Subject: RE: Flying Heart Application

Tim,

What were you able to find out about the December 3 date for the pre-hearing conference continuation? I would like to advise Allen Merritt today if possible should that date work for you and Larry.

Thanks,

Gary

From: Gary Slette
Sent: Friday, November 07, 2014 12:31 PM
To: 'Tim Graves'
Cc: 'Jack Bariteau'; 'Charles E. Brockway'; 'mpietsch@MARKETRON.COM'
Subject: RE: Flying Heart Application

Tim,

The Thomas right had a new POD added from the river because they were not able to secure their water with any degree of reliability. They have installed a pump and pipeline, and with that degree of reliability, I'm certain that they will continue to divert in that fashion. They are not a part of this application, and I'm certain

they do not want to be, although they are supportive of our efforts. The good news is that given the close proximity of Flying Heart's discharge to the river and the Thomas POD, there will be an inflow into the river that would about equal their extraction if our permit is approved.

As to the CM issue, I a non-consumptive right would not be impacted because the whole idea behind CM is to regulate consumptive water users. Whatever the IDWR does in the future is something that we can't speculate on, but I really don't see that changing, and I certainly have not heard anything to the contrary in my dealings with the department.

Gary

From: Tim Graves [<mailto:tgraves@co.blaine.id.us>]
Sent: Wednesday, November 05, 2014 5:50 PM
To: Gary Slette
Subject: RE: Flying Heart Application

Gary,

On the Thomas right, it was Larry's and my understanding from yesterday's presentation that the 2.5 cfs Thomas right would now be delivered via the connected stream improvements through Flying Heart. Thomas would relinquish his surface diversion from the BWR, unless it was necessary to re-open that diversion in times of low flows. This raised the questions of whether Thomas needs to be an applicant since his source of water would now apparently be GW and not SW, and how the re-opening of the Thomas diversion in low flows would work administratively. I think some clarification is needed on this aspect of the application. Is there no change to the Thomas diversion/right except the connection and addition of the Flying Heart GW?

The big question for IDWR is going to center around conjunctive management and whether the no injury standards of SW management will similarly apply to GW management. If, as you suggest, IDWR has no issue with a small drawdown for other GW users nearby, a transfer of GW into SW, and a delayed return of that GW down gradient, then there is not much left of the protest. Conversely, if IDWR changes its tact on GW injury, it will be difficult for the application to be approved. I don't know if it is possible to get a pre-hearing determination or narrow down the extent of the issues to be heard, but I believe this to be the pivotal issue going forward.

Larry was fine with moving the pre-hearing conference to give us more time to discuss potential resolution, but he too will be out of town the week of Thanksgiving and asked that we move it to the first week of December (1st, 3rd, 4th).

Tim

Timothy K. Graves

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Blaine County Prosecuting Attorney's Office

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From: Gary Slette [<mailto:gslette@rsidaholaw.com>]

Sent: Wednesday, November 05, 2014 9:41 AM

To: Tim Graves

Subject: Flying Heart Application

Good morning Tim,

Thanks for being at the meeting yesterday. I've spoken with Ned Williamson this morning, and we will be providing him with an analysis of the effect of the proposed extraction on Hailey's Northridge well which I understand will show negligible, if any, impact with regard to drawdown.

With regard to the well drawdown issue, it appears that even at full extraction, the maximum effect on a well located 200 feet away is only .2 foot, or two inches. It seems to me that the "reasonable pumping level"

requirement of Idaho Code 42-226, and the cases that have interpreted that section, would support the HOA's application. Senior groundwater appropriators are protected only as to the level of reasonable pumping levels, so if the static water level in a well dropped two inches, I don't think anyone could say that would create an unreasonable pumping level. (Presumably, anyone's pump is located many feet below the static water level in any event.)

I understood Larry Schoen's position with regard to the coming greater regulation of ground and surface water rights through conjunctive management, but I am of the opinion that a non-consumptive groundwater right will not be impacted by priority regulation of consumptive groundwater rights. Chuck and Will have been working to make certain that the reduction in pond area will decrease evapotranspiration losses in the system to justify the non-consumptive nature of this application.

Finally, and as you suggested, the HOA has asked Chuck to look at a reduced diversion rate to see if something different might work. I don't know if I'm correct or not, but it appeared to me that there may have been a misperception about the downstream neighbor's water right. Larry Schoen kept saying that the HOA has 3.0 cfs that the springs are currently producing, and the 2.5 cfs of Perry Thomas, so why isn't this application for only 4.5 cfs? The Thomas water right is pumped directly from the Big Wood River at a point downstream of the Flying Heart property. His water does not run through the HOA system, so there is no 2.5 cfs that we are using as a part of the HOA's stream and pond system. If I'm wrong in what I thought he was saying, I will stand corrected, but I wanted you to know that the Thomas water right is not involved in any way in this matter. The Thomases are supportive of this application because they are interested in seeing the successful river reconnection efforts of Chuck and Will come to pass.

Chuck and/or Jack will prepare a response as to the unique nature of this application with regard to the request made by you and Larry. I sense there is still an avenue for potential resolution, and with that in mind, do you think we should jointly ask Allen Merritt for a two week extension on the pre-hearing conference scheduled for next Wednesday? I'm going to run that idea past Jack to see what he thinks, but I thought I would float it to you to get your thoughts.

Regards,

Gary

Gary D. Slette

Robertson & Slette, PLLC

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