

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 37-21338

Exam Date: 10/7/12

1. Current Owner: THE VALLEY CLUB INC
PO BOX 252
SUN VALLEY ID 83353
(208)788-0997
2. Accompanied by: Gerry Flaherty for the Valley Club
Phone No: 471-0426
Relationship to Permit Holder: staff member of the golf course

3. SOURCE TRIBUTARY
BIG WOOD RIVER MALAD RIVER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: see attached spreadsheet
2. Other water rights with the same point of diversion: several rights divert from the Hiawatha diversion but, the rights that are diverted at the same PD and pertain to the golf course are identified on an attached spreadsheet

C. DIVERSION AND DELIVERY SYSTEM

1. LOCATION OF POINT(S) OF DIVERSION:

BIG WOOD RIVER SW1/4NW1/4 Sec. 20, Twp 03N, Rge 18E, B.M. BLAINE County

Method of Determination: Field visit and existing PD at the Hiawatha Canal

2. PLACE OF USE: AESTHETIC STORAGE/ RECREATION /AESTHETIC/ RECREATION STORAGE

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
03N	18E	29	X			X									X				
03N	18E	20																X	

Method of Determination: Aerial Imagery

3. ☒ Delivery System Diagram Attached (required).
☐ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required).
☐ Aerial Photo Attached (required for irrigation of 10+ acres).
☐ Photo of Diversion and System Attached

4.

<u>Well or Diversion</u> <u>ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge</u> <u>Size</u>
Hiawatha Canal at the Big Wood River A0009794				2 re-lift pumps at 20 and 30 hp and gravity flow	
Diversion to storage from the canal-A0017547,				gravity flow (43.568114, -114.330817)	

D. FLOW MEASUREMENTS

1. Measurement Equipment Type

Weir 2' Cipolletti (diversion to storage) and 12' Rectangular (Hiawatha)
Flow meter McCrometer
10' culvert and stop watch (Hiawatha)

2. Measurements:

- Diversion to storage--Two measurements, using a Cipolletti weir and a McCrometer, were recorded at the point where water is diverted away from the Hiawatha to the golf course pond #14 and #15, which then can be pumped towards ponds #1-13. Note that the two measurements couldn't be reconciled. The measurement at the weir was taken much later in the day. The weir did have a high water mark above the water level that was used to measure the diversion rate. Unfortunately, a reading at the McCrometer wasn't done in the afternoon but, it appears that the discrepancy may have simply been a timing issue as I confirmed with Dave Cropper of the Hiawatha canal that at the time of the measurement water was being cut in the canal to provide for fish flows.
 - the weir measure = 0.84 cfs (afternoon measurement)
 - the McCrometer reading = 2.86 cfs (morning measurement)
 - the pipe diverting water away from the Hiawatha is 10" in size and can accommodate a diversion rate of 2.73 cfs when designed at 5 fps.
- In addition, flows in the Hiawatha were measured that morning
 - the 1st discharge point into the Hiawatha measured 4.97 cfs at a rectangular weir. There are two re-lift pumps that provide water at this point.
 - the 2nd discharge point is gravity flow. A second measurement was taken before the Hiawatha leaves the golf course, downstream of all the ponds. The measurement includes all Hiawatha water. The Hiawatha measured 21.8 cfs total. The 2nd discharge point provided 16.83 cfs ($21.8 - 4.97\text{cfs} = 16.83\text{ cfs}$).

E. FLOW CALCULATIONS

Measured Method:

The diversion to storage component should be licensed for the permitted diversion rate of 2.02 cfs. Although the total diversion from the 1st discharge point and the 2nd discharge point totals 21.8 cfs, the total amount of water that can move throughout the entire pond network is ~ 2.86 cfs.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: NA

2. Volume Calculations for Other Uses:

Volume to fill ponds – 26.4 af (the ponds are never really emptied in the fall/winter, the ponds stay ~ ½ full and are topped off in the spring—however this volume is based on a measured depth by Brockway Eng.-also see pond spreadsheet in the attachments)



Volume for evaporation – 13.3 af (see attached pond evap. spreadsheet. Note the evaporation is covered by 37-657B.

Volume to refresh the ponds – water is diverted away from the Hiawatha canal via gravity flow to the ponds, the water is constantly flowing to the ponds, constantly refreshing them

Live flow (potential volume of permit) – $2.02 \text{ cfs} \times 1.9835 \times 200 \text{ days} = 801.3 \text{ af}$

Actual volume diverted during the development period = 184.6—see memo dated 11/29/16

Permitted volume for storage – 31.0 af

Recommend a licensed volume of 26.4 af based on pond calculations and 184.6 for live flow.

G. NARRATIVE/REMARKS/COMMENTS

Recreation and Aesthetic uses under Right 37-657B authorize 13.4 af to be used for the replacement of losses caused by evaporation from the 6.3 acre total surface area of the ponds established under Right 37-21338 (ponds are lined). However, the surface area is 7.7 acres based on 2011 imagery. The permit does not limit the surface area so the license will reflect ponds that cover 7.7 acres. The evaporation is fully covered by 37-657B per evaporation loss calculation enclosed in this exam.

System

Water is diverted out of the Big Wood River (photo 1 and 2) into the Hiawatha canal. From there, a pumping station delivers some of the canal water under Hwy 75 where it enters a channel (photos 6 and 7). Water is diverted out of the channel through a collection box off the side of the canal (photos 10 and 11). The underground pipe from the collection box diverts into a second collection box that contains a weir. Inside the collection box is a 10" pipe where water is then carried to Pond #14 (photos 12-18). Water is then delivered to Ponds 8-13 and 15. There is a pumping station at the north side of Pond 15 where water is delivered to Ponds 1-7, underground. Overflow water is discharged into a separate network of ponds that go back into the Hiawatha. Those ponds are authorized by different water rights. Ponds 16 and 17 receive water directly through the canal (on-stream ponds). See the schematic attached to an email from Eric Powell from Brockway Eng. dated 5/31/2013.

Conditions

Condition #7 of the permit was of concern. I contacted Barry Beaver, the general manager for the golf course to determine if the condition was met. See email chain ending on 7/26/13 to view the conversation. Ultimately, I ended up talking with Dave Cropper, the contact for the Hiawatha canal, on the phone regarding water use during the development of the golf course. Dave doesn't have records that date back to that era but recollects that Valley Club used less irrigation water that year, compared to other, because they didn't need the water.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
REC/AESTHETIC STORAGE	04/15 to 10/31		26.4 AF
REC/AESTHETIC	04/15 to 10/31	2.020 CFS	184.6 AF
DIVERSION TO STORAGE	04/15 to 10/31	2.020 CFS	
	<u>Totals:</u>	2.020 CFS	184.6 AF

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

☒ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name Chris Elmer Date 11/2/2016

Reviewer _____ Date _____



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5

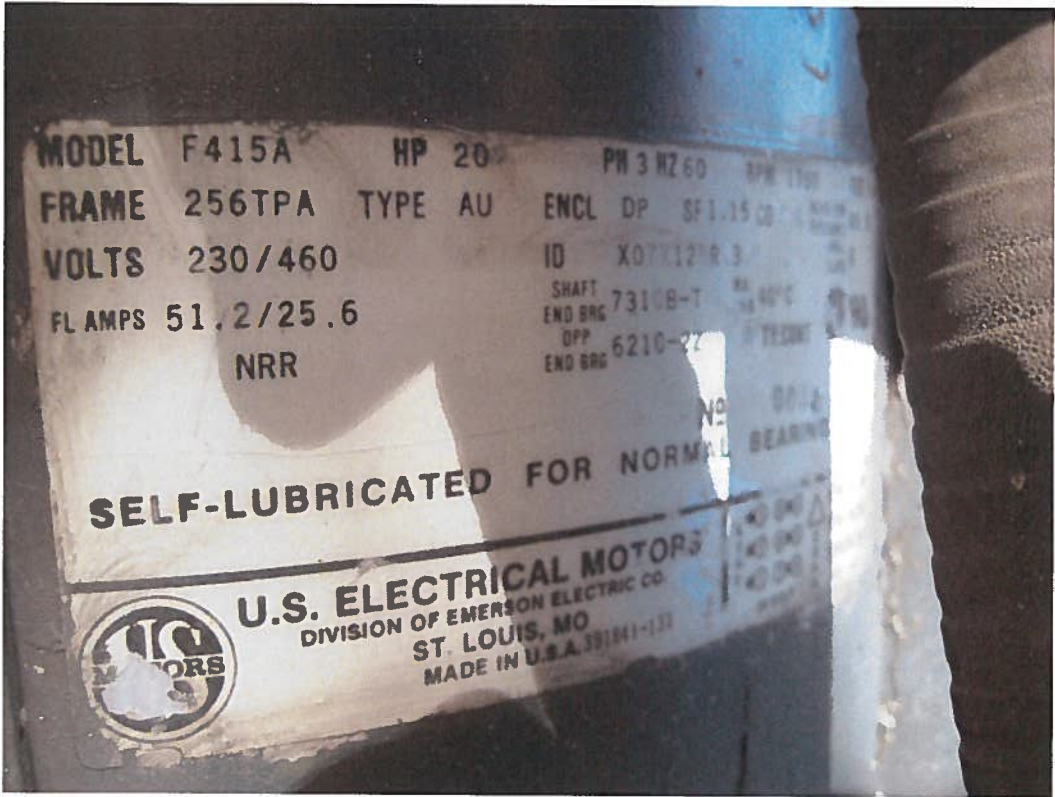


Photo 6

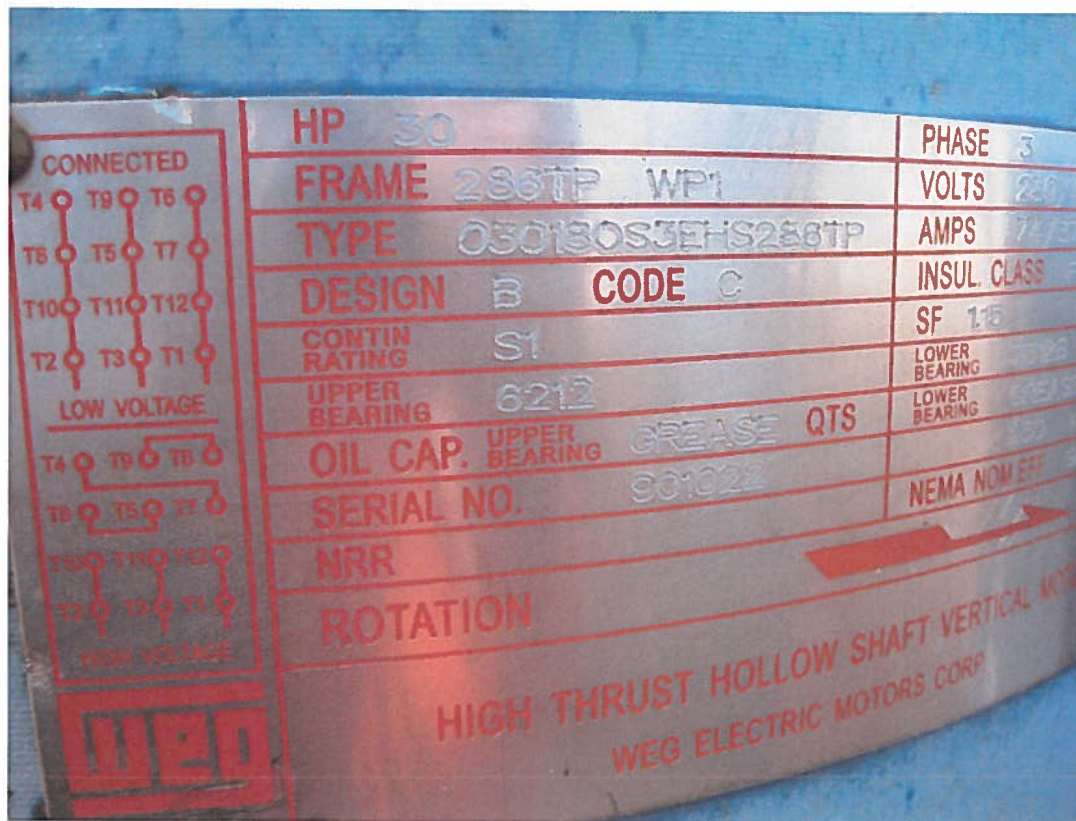


Photo 7



Photo 8

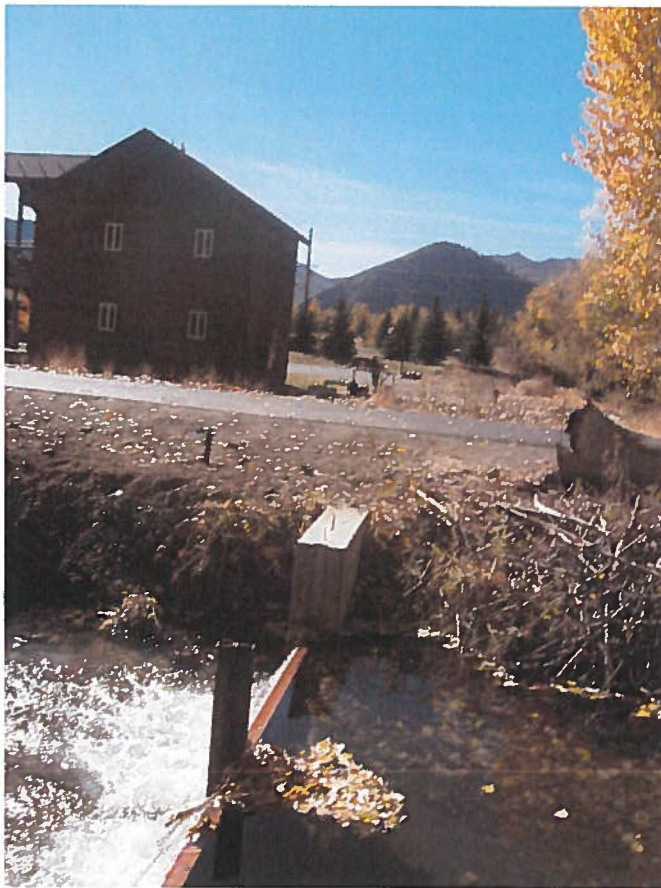


Photo 9



Photo 10



Photo 11



Photo 12

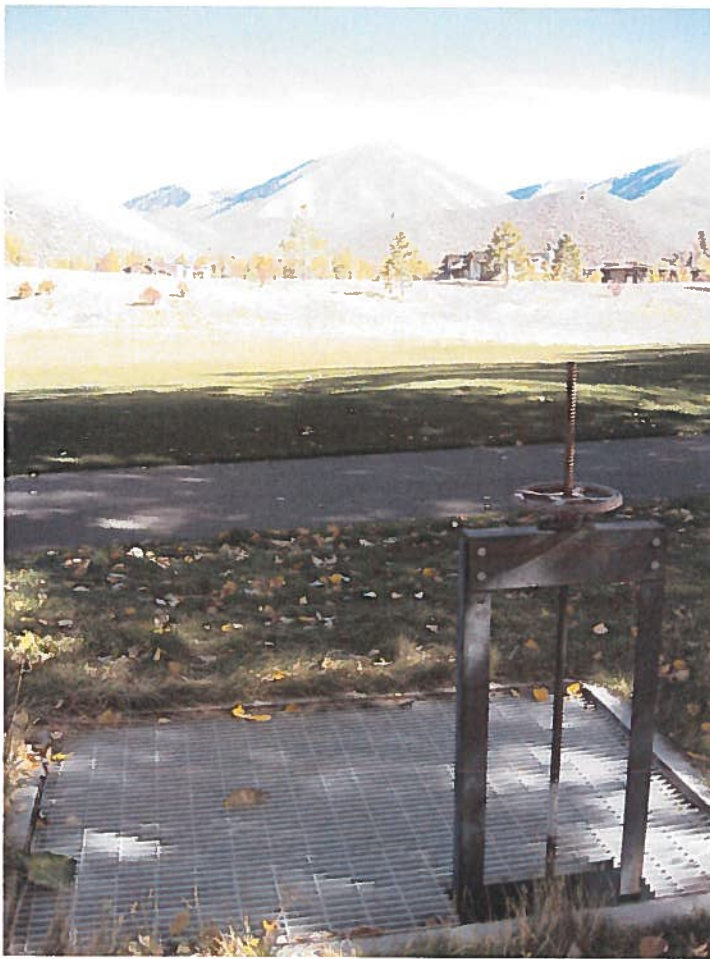


Photo 13



Photo 14



Photo 15

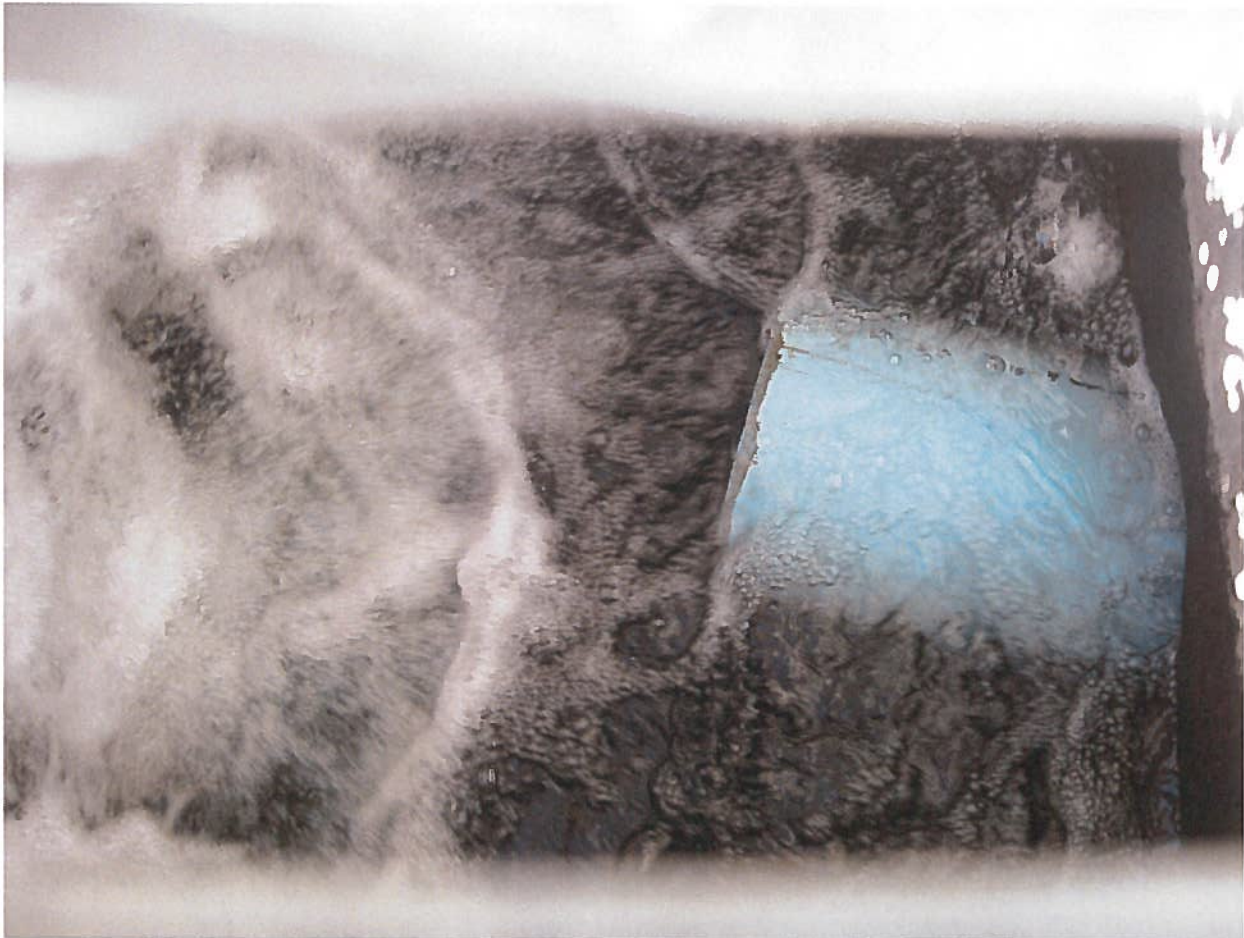


Photo 16



Photo 17



Photo 18

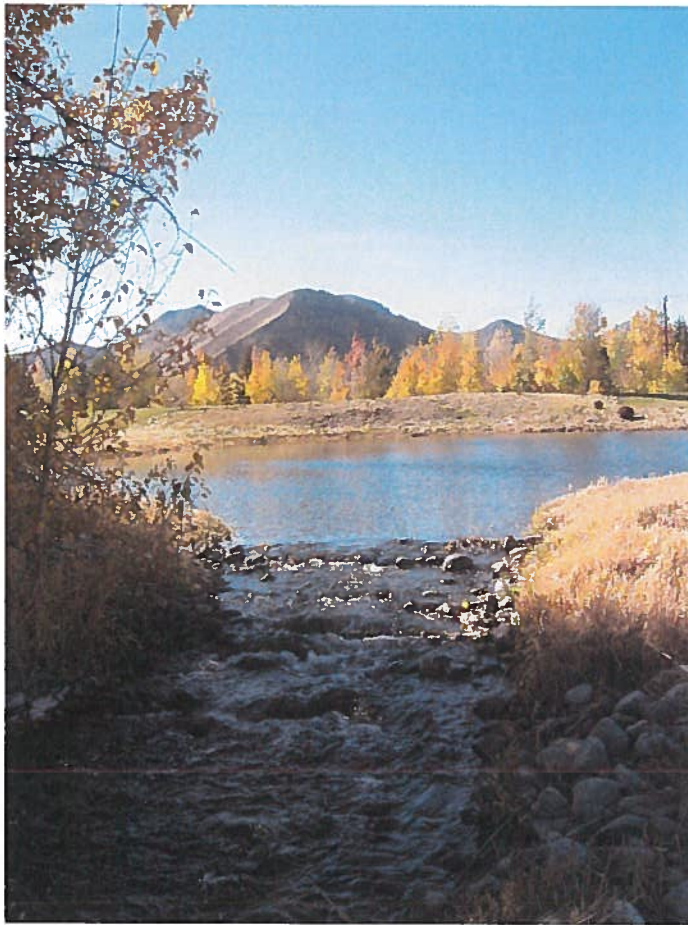


Photo 19

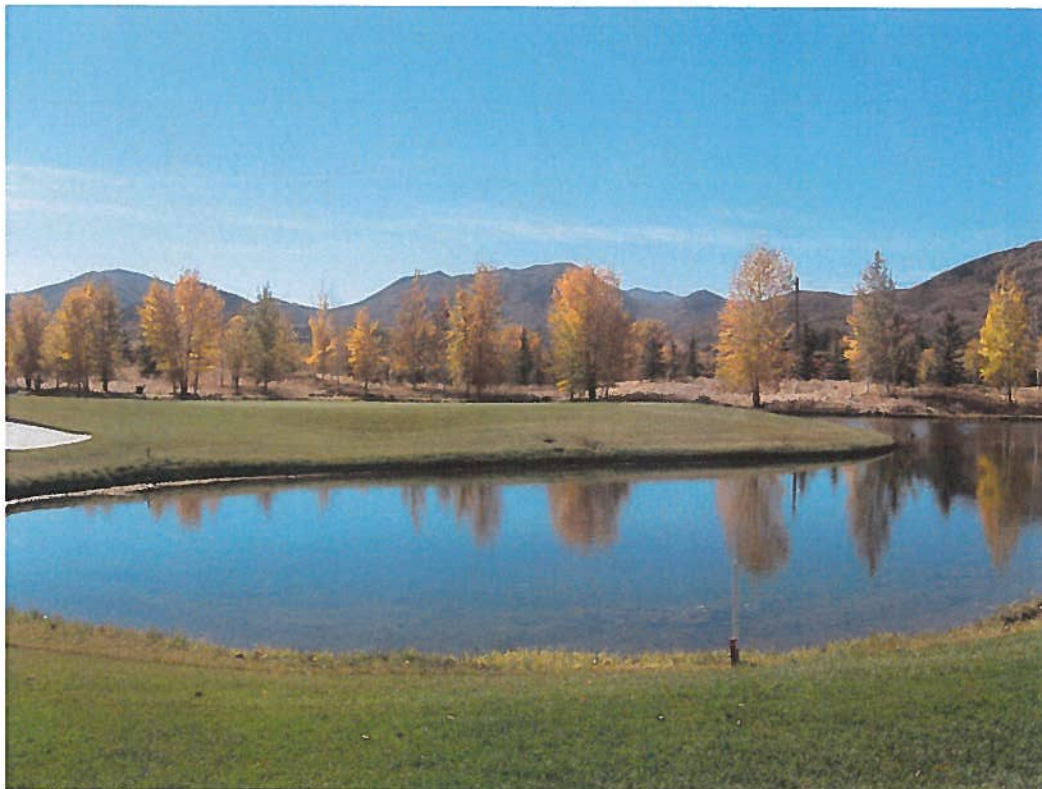


Photo 20

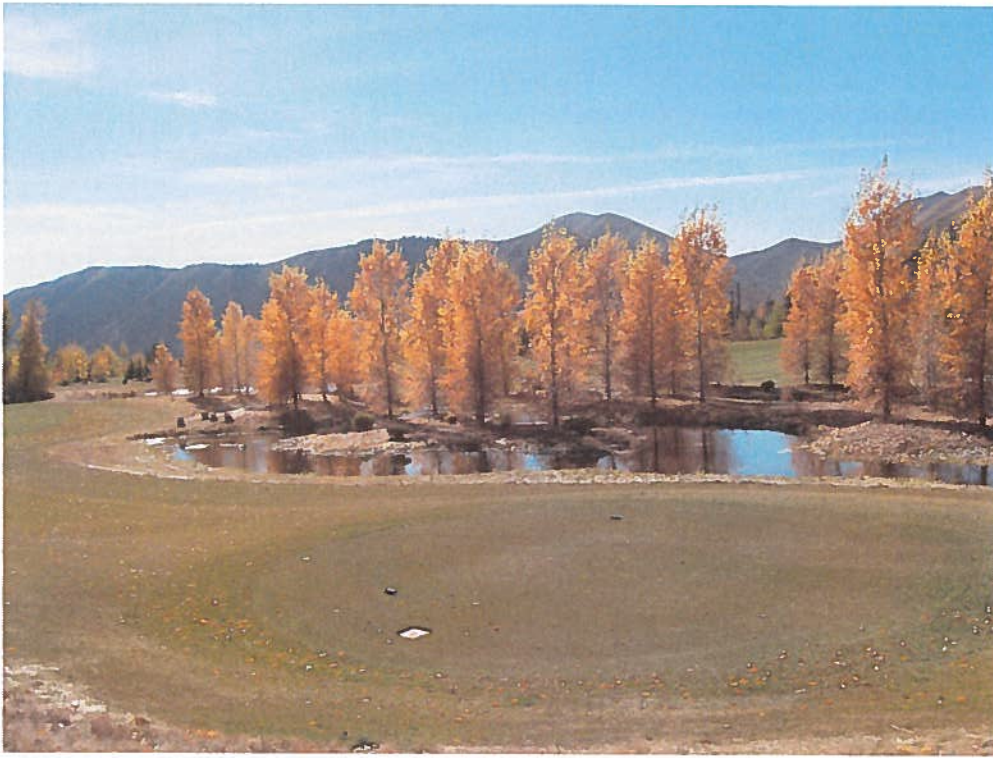


Photo 21

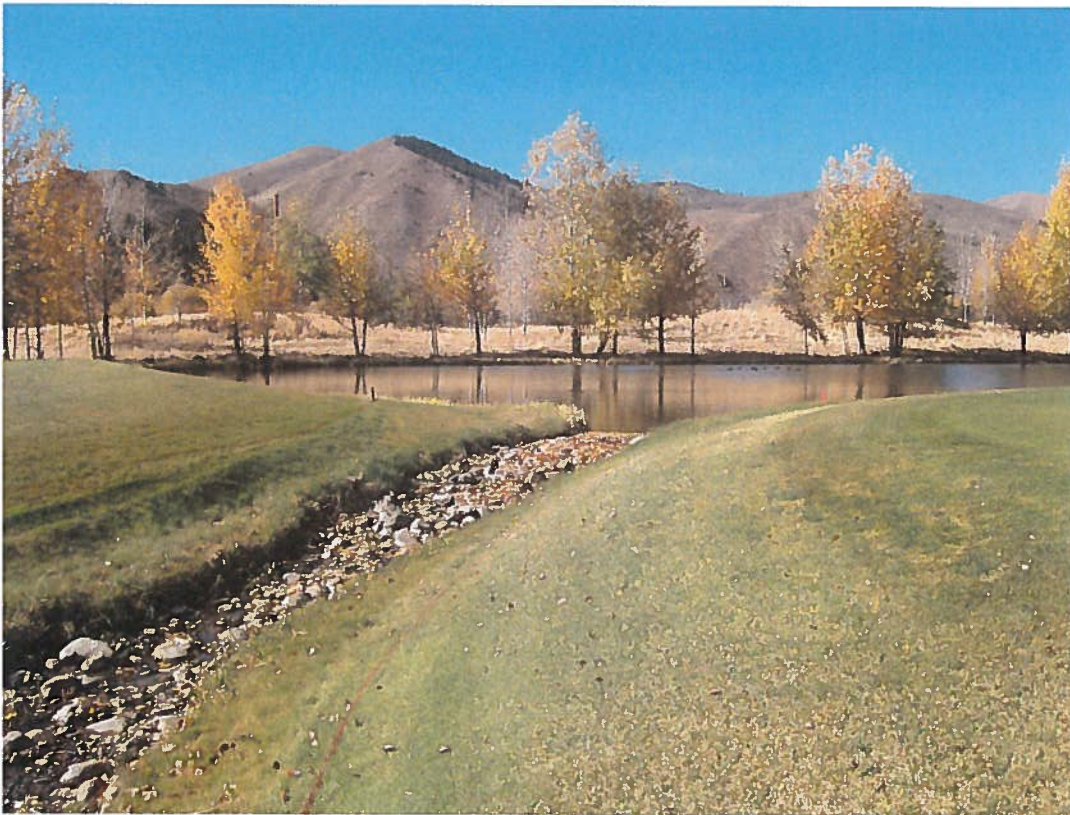


Photo 22



Photo 23



Photo 24

Evaporation Loss Calculations

This spreadsheet has been designed by Idaho Department of Water Resources to estimate the annual evaporation losses from a pond.

FILE NUMBER	37-21338
REVIEWER	Cpalmer
DATE	11/1/2016

User Input
Calculated value
Formula Explanations

The acronyms used on the Kimberly Research Center website are defined below:
P = Precipitation
ET= Evapotranspiration
P _d = Precipitation deficit
P _d =ET-P

USING THIS SPREADSHEET

Use the link below to access the Kimberly Research Center website. This website provides the Precipitation Deficit for a station most representative of the pond under examination. The Precipitation Deficit is the total amount of free water surface evaporation minus the precipitation for a given area, which gives the total amount of evaporative losses incurred by the pond. There are several weather sites that are used throughout the state. IDWR staff can find the nearest site using Arc Map. The shape file containing the sites can be found at <X:/Spatial/Climate/ETIdahostations.shp>.

Instructions:

1. Use the link below to navigate to ET Idaho 2012.
2. Select the station which is most representative to your pond location.
3. Click Submit Query.
4. Under "Land Covers with Evapotranspiration Estimates," select "Open Water - Shallow Systems (ponds, streams)" or "Open Water - small stock ponds" depending on the pond size.
5. Click the link to "Precipitation Deficit."
6. Reference and copy (ctrl + C) the first subheading "Mean" values.
7. Click the "Paste Values from ET Idaho" button. The table will automatically enter a zero (0) for any negative precipitation deficit values.

Found at: <http://data.kimberly.uidaho.edu/ETIdaho/>

Precipitation Deficit

Station: Twin Falls 2 NNE (NWS -- 109294)

Month	mm/day ¹	Days per month	mm/Month
Jan	-1.35	31	0.00
Feb	-0.84	28	0.00
March	0.18	31	5.58
April	1.42	30	42.60
May	2.24	31	69.44
June	2.83	30	84.90
July	3.96	31	122.76
August	3.33	31	103.23
September	2.18	30	65.40
October	1.00	31	31.00
November	-0.56	30	0.00
December	-1.78	31	0.00

PLEASE NOTE: The seasonal average for precipitation deficit should not be used for calculations because precipitation often exceeds evaporation during wetter months of the year. If the pond is kept full, excess precipitation during wetter months does not serve to refill the pond during drier months.

For example, see Sandpoint KSPT (NWS -- 108137), the annual precipitation deficit is -106 mm. However, April through September have positive precipitation deficit values. To properly estimate the annual volume of water necessary to refill a pond due to evaporation losses, the table will automatically enter a zero (0) for each month that the precipitation value is reported as a negative value.

As described above, precipitation offsets evaporation in winter months, so the net effect is that wintertime precipitation deficit is usually zero.

Total mm/year = 524.91

$$\left(\frac{524.91 \text{ mm/yr}}{304.8} \right) \times 7.70 = 13.3 \text{ AFA}$$

[(mm/yr) ÷ (convert to feet)] X (Surface area of pond, in acres) = Evaporation Loss in Acre Feet

Pond #	Surface Area (ft2)	Converted to Acres	Max Depth (ft)	Pond Capacity (slope factor = 40%) af
1	5728	0.13	10	0.53
2	5927	0.14	7	0.38
3	5483	0.13	6	0.30
4	2472	0.06	6	0.14
5	2846	0.07	4	0.10
6	7877	0.18	5	0.36
7	7256	0.17	7	0.47
8	19881	0.46	10	1.83
9	4262	0.10	6	0.23
10	1894	0.04	4	0.07
11	2937	0.07	6	0.16
12	5012	0.12	6	0.28
13	8307	0.19	6	0.46
14	93805	2.15	12	10.34
15	53239	1.22	7	3.42
16	33328	0.77	7	2.14
17	42065	0.97	8	3.09
	302319	6.94	117	24.29
*Extra acres		0.76	6.8 average	2.1
		7.7 ACRES	Total Capacity 26.4 af	

*The measurements regarding ponds size taken by Brockway Engineering was analyzed and for the most part their measurement are consistent. However, there are a few spots in the channel that are especially wide that appear to impound water that should be accounted for.

The figures in the red columns are provided by Brockway Engineering

Type	WR #	Owner	Source	TRS	SWNW	SENW	NWSE	SESE	Total
Right	37 30007	THE VALLEY RANCH PARTNERS,	BIG WOOD RIVER	03N18E20			X	X	rec
Right	37 494	THE VALLEY CLUB INC,	BIG WOOD RIVER	03N18E20			X	X	rec
Right	37 495	THE VALLEY CLUB INC,	BIG WOOD RIVER	03N18E20			X	X	rec
Right	37 577BV	THE VALLEY CLUB INC,	BIG WOOD RIVER	03N18E20			X	X	rec
Right	37 833K	THE VALLEY CLUB INC,	BIG WOOD RIVER	03N18E20			X	X	rec
Right	37 2623	THE VALLEY CLUB INC,	GROUND WATER	03N18E20	X		X	X	rec
Right	37 657B	THE VALLEY CLUB INC,	BIG WOOD RIVER	03N18E29	X	X			storage
Permit	37 21338	THE VALLEY CLUB INC,	BIG WOOD RIVER	03N18E29	X	X			rec/storage/div to storage

→ Diverted through a different system - no system overlap

37-2623 - ground water diversion - no overlap w/ PD or system