

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 73-12203
Exam Date: 06/14/2024

1. Current Owner:
KEVIN YELTON 395 PAHSIMEROI RD ELLIS ID 83253
2. Accompanied by: Kevin Yelton
Phone No: (208) 339-0529 Cell
Address: Same as mailing address for permit
Relationship to permit Holder: Self

3. **SOURCE:**
SPRING

Tributary
PAHSIMEROI RIVER

Method of Determination: GARMIN TREX20 GPS and GIS

B. OVERLAP REVIEW

1. Other water rights with the same place of use: YES Overlap

Water Right No.	Source	Purpose of Use	Basis
73-10126	SPRING	STOCKWATER	DECREED 2000
73-4025	SPRING	IRRIGATION	DECREED 2009

Comments: Two water rights overlap the permitted place of use (POU) and have a spring source. The shapefile for right 73-10126 is the entire SENW of section 8, however, the decree identifies a different parcel than the permitted POU is within. Right 73-4025 allows for irrigation of 24 acres and has a 38-acre shapefile which includes the roadway easement where the only overlap with the permit POU occurs.

2. Other water rights with the same point-of-diversion: NO Overlap

Water Right No.	Source	Purpose of Use	Basis
NONE	NA	NA	NA

Comments: No other rights share the permitted point of diversion (POD). Right 73-10126 has a source that was likely for springs found in several places along the hillside of the permit POD. However, the stockwater right is held by the owner of the parcel adjacent to the permit POU and could just as likely have been used historically there, as springs also emerge from the hillside north of the permit holder's parcel.

C. DIVERSION AND DELIVERY SYSTEM1. **LOCATION OF POINT(S) OF DIVERSION:**

SPRING NE¼ SE¼ NW¼, Sec. 8, Twp 15N, Rge 21E, B.M. LEMHI County

GPS COORDINATES: **N44° 38.954' W114° 00.199'**

Method of Determination: GARMIN TREX20 GPS and GIS.

PLACE OF USE: IRRIGATION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
15N	21E	8								0.9									0.9

Total Acres: 0.9

PLACE OF USE: STOCKWATER

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
15N	21E	8								X									

PLACE OF USE: STOCKWATER STORAGE

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
15N	21E	8								X									

Method of Determination: Lemhi County tax parcel information, GIS, and Google Earth PRO.

3.
 - ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components.
 - ☒ Indicate weir size/pipe as applicable.
 - ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
 - ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
 - ☒ Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
Spring	NA	NA	NA	NA	NA

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
NONE	NA	NA	NA	NA	NA	NA

2. Measurements: IDAPA Beneficial Use Examination Rules 37.03.02.35.01.r.i. & ii.state that a direct measurement of the diversion rate is not required for up to five acres of irrigation and Storage of up to fourteen point six (14.6) acre-feet of water solely for stock watering purposes. The flow of the springs necessary to maintain the pond level observed during the field examination indicate that the 0.08AF pond is capable of filling within 24 hours making an irrigation storage use not necessary on the license.

E. FLOW CALCULATIONS

Additional Computation Sheets Attached

Measured Method: The Hazen-Williams Equation was used to make a theoretical calculation to find a reasonable diversion rates from the gravity fed system. Administrative Memos #3 & 17 were used to further determine reasonable rates for stockwater and irrigation respectively.

Hazen-Williams Equation:

$$V = k \times C \times R^{0.63} \times S^{0.54}$$

k= 1.318 (conversion factor)

R= A/P (area of cross section / wetted perimeter)= $\pi \times 0.03125^2 / 2 \times \pi \times 0.03125 = 0.03125 / 2 = \mathbf{0.015625}$

S= 10ft/62ft= 0.1613

$$V = 1.318 \times 150 \times 0.015625^{0.63} \times 0.1613^{0.54} = 1.318 \times 150 \times 0.0728 \times 0.3733 = 5.37 \text{ ft/sec}$$

$$A = \pi \times 0.03125^2 = \mathbf{0.00307 \text{ ft}^2}$$

$$Q = V \times A = 5.37 \times 0.00307 = \mathbf{0.016 \text{ cfs}}$$

$$Q = \mathbf{0.02 \text{ cfs/per poly line} \times 4 \text{ poly lines} = 0.08 \text{ cfs}}$$

friction coefficient for plastic "C"= 150

Hydraulic radius for 3/4" plastic pipe "R"= 0.015625

Pipe length= approx. 62 ft

Max Drop in elevation=approx. 10ft

Slope "S"=0.1613

Theoretical Calculation= 0.08cfs

Permit allowed = 0.05cfs

Recommendation= 0.05cfs

Comments:

Approximately 0.9 acre of irrigation was measured using imagery. The irrigation system was comprised of multiple 3/4" poly pipe delivering water gravity fed to distribute water throughout the POU. The pond is filled by several springs emerging from the hill east of the pond. Several larger PVC and ABS pipes divert water from the springs on the hillside bridging the pond to apply water directly to the POU. The permit holder also uses a 3/4" poly line to fill the stockwater tank that can be used throughout the POU.

The theoretical calculation found that the 4-6 gravity fed irrigation diversions are capable of 0.08 to 0.10 cfs. However, the use was only permitted for 0.05cfs. maximum, and only 0.9 acre of irrigation is provided by the springs. Administrative Memo #3 allows for up to 0.02cfs watering up to 10 head of range cattle. Administrative Memo #3 allows a rate of 0.03 cfs/acre for the irrigation of up to 5 acres. I am recommending the full permitted 0.05cfs total maximum diversion rate with maximum rates of 0.03cfs for irrigation of 0.9-acre, and 0.02cfs for stockwater for the watering of 2 cows and less than 12 geese on to the license.

F. VOLUME CALCULATIONS**1. Volume Calculations for irrigation:**

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 0.9 \text{ acre} \times 3.5 \text{ AF annually} = 3.2 \text{ AF}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.03 \text{ cfs} \times 214 \text{ days} \times 1.9835 = 12.7 \text{ AF}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 3.2 \text{ AF annually}$$

Comment: I recommend the license is issued with an annual volume of 3.2 AF for the irrigation of 0.9 acre, per the field headgate requirement calculation above.

2. Volume Calculations for Other Uses:

Stockwater Storage:

The capacity of the pond is 0.1 AF, per the attached pond spreadsheet, average depth of the pond, and GIS measured pond surface area. I recommend the license is issued with an annual volume of 0.1 AF for stockwater storage use.

Stockwater:

0.2 AF annually is a reasonable volume for the watering of up to 10 head of cattle, per Administrative Memo #3. At least 2 range cattle and less than a dozen geese were observed at the time of the field examination. I recommend the license is issued with an annual volume of 0.2 AF for stockwater use.

Irrigation Storage:

The pond capacity and the calculated diversion rate from a pond which is maintained by spring flow indicates the pond can be filled within 24 hours (see Pond Calculation Spreadsheet and Figure 1) making an irrigation storage use unnecessary on the right.

G. NARRATIVE/REMARKS/COMMENTS

The Proof of Beneficial Use for the irrigation use developed under permit 73-12203 was received by IDWR on October 31, 2016. In section #5 that the extent of beneficial use developed as the irrigation of 2 acres and stock watering for 2 horses, 4 sheep, and 10 cows. However, the use is limited by X02 on the permit which states that the stockwater use is for 5 horses and 5 cows. A field examination was conducted with Kevin Yelton (permit holder) as escort on June 14, 2024. GIS coordinates were recorded for the spring source and photos were taken documenting the irrigation and stockwater uses. Two cows were observed during the field examination.

The permit holder described the irrigation system as several poly lines gravity fed from the storage pond and 2-3" PVC and ABS pipes circumventing the pond at several locations along the hillside where spring water emerges to deliver water directly to the POU. About 4 to 6 poly lines were observed and photographed, one of which was capable of reaching and filling a stockwater tank at the south end of the POU. The permit holder explained that the area irrigated by the spring and pond was all in the field to the NE of the home, and the poly lines can be repositioned to distribute water throughout the POU. A GIS measurement of the irrigation POU confirmed with the permit holder is approximately 0.9 acre. A theoretical calculation was made to determine the maximum rate possible for the gravity fed system. A bucket test is not practical for a gravity fed system with a maximum elevation change of 10 ft, as elevating the line from ground level would reduce the rise and reduce the rate significantly.

I recommend the license is issued with a maximum total rate of 0.05cfs, a maximum rate of 0.03cfs for the irrigation of 0.9 acre (per Admin. Memo #17 and section E), a maximum rate of 0.02cfs for stockwater (per Admin. Memo #3 and section E), annual volumes of 3.2 AF for irrigation (per section F), 0.1 AF for stockwater storage (per section F and Pond Calculation Spreadsheet), 0.2 AF for stockwater (per Admin Memo #3 and section F), and with conditions R05, R02, 196, 197, 198, 220, and R67. Condition 01H should be replaced with R02 at licensing, per current guidance. Condition 029 should be removed as no correspondence was received from Idaho Fish and Game regarding fish screening requirements. Condition X02 should be removed, per current guidance. Condition R63 should be replaced with condition R67 for the license, as it would still allow the recommended rate to be within the permitted rate, align with guidance for the condition that should be carried on a small acreage irrigation permit, and Administrative Memo # 17 for up to 5 acres of irrigation.

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

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
IRRIGATION	04/01 to 10/31	0.03 CFS	3.2 AF
STOCKWATER	01/01 to 12/31	0.02 CFS	0.2 AF
STOCKWATER STORAGE	01/01 to 12/31		0.1 AF

Totals:

0.05 CFS

3.5 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 ☒ None

I. AUTHENTICATION

Bob Howe - Water Resource Agent, Sr.

Field Examiner's Name



Date

2/11/2023

Reviewer



Date

2/11/2023



Photo 1- Two areas where spring flow can be seen emerging from the hillside. In several locations PVC or ABS is used to divert water from flows to circumvent the pond for direct application to the POU.



Photo 2- Facing north from the south end of the pond. The pond is approximately 2ft deep on average and a maximum of approximately 4 ft wide.



Photo 3- Facing south on the west side of the pond. Pipes bridging the pond are reduced to poly lines distributing water throughout the POU.



Photo 4- Facing west towards the roadway. Poly lines are capable of distributing water to areas near the roadway.



Photos 5 & 6- Stock water tank in enclosure on the south end of the POU. On the left the poly line for filling the tank and irrigation can be seen in the foreground.



Photo 7- Two head of range cattle were in the POU at the time of the examination (lying down in the shade in photo). The permit holder stated that at most 10 head of mixed livestock have been cared for within the POU throughout the development period.

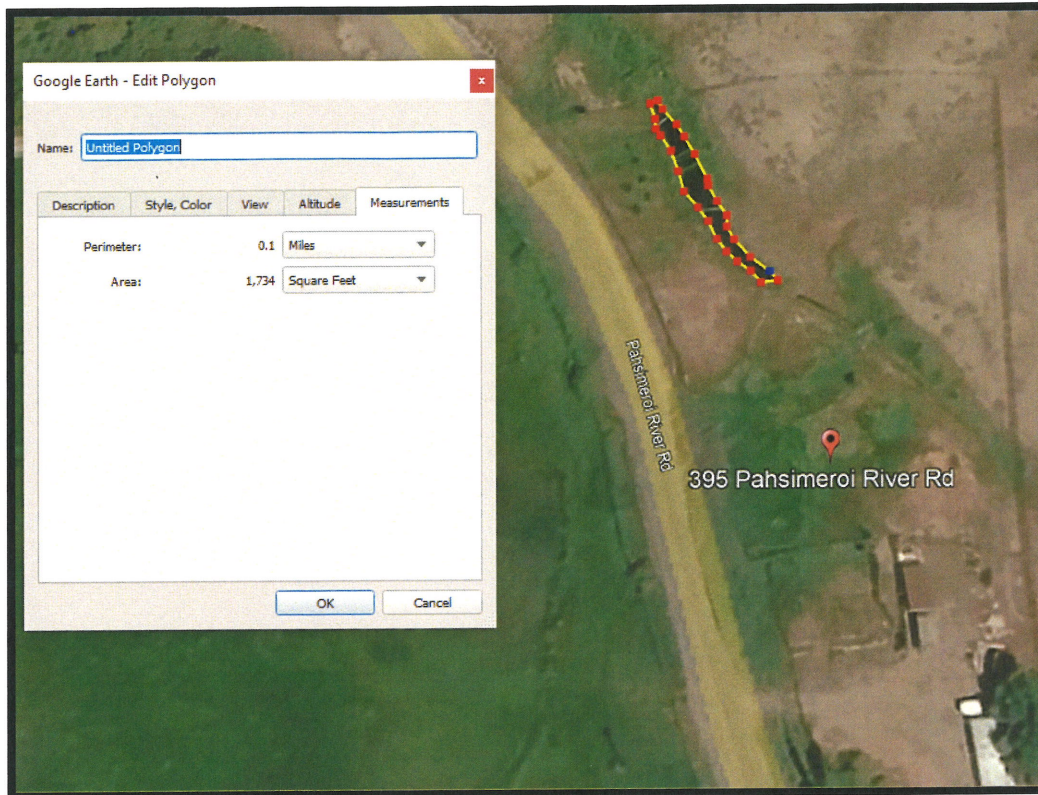


Figure 1- Google Earth GIS measurement of the maximum pond area during the development period.



Figure 2- NRCS website aerial imagery of the pond. The orange outlined area is the AOC for the soil report, which found a seepage rate of 0.2 ft/day.



Figure 3- NAIP 2023 aerial imagery. The storage area is outlined in orange and the irrigation and stockwater use area is outlined in yellow. The permitted POU areas to the south were excluded as the permit holder stated that the use was never developed for any area aside from the field on the north end of the parcel.



Figure 4- System Diagram.

POND CALCULATION SPREADSHEET

FILE NUMBER	73-12203	
REVIEWER	Bob Howe	
DATE	2/4/2025	
INPUTS		
Pond Surface Area (AC.)	0.04	AC.
Pond Surface Area (SQ. FT.)	1742	SQ. FT.
I used the following method to obtain my Soil Classification information:	NRCS Web Soil Survey	
My Soil Classification is	GC	
Suggested Seepage Rate (FT./DAY)	0.2000	FT./DAY
Formula: (Surface Area X Seepage Rate) X 7.48 = Gallons Per Day Loss		
Convert to GPD	2607	GPD
Total Seepage Loss (AFA)	2.9	AFA

FILE NUMBER	73-12203	This spreadsheet has been designed by Idaho Department of Water Resources to estimate the total seepage, evaporation and fill capacity required for a pond.	User Input
REVIEWER	Bob Howe		Calculated value
DATE	2/4/2025		Formula Explanations
Print Page to PDF			
Surface Area (AC.)	0.04	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.	
Average Pond Depth (FT.)	2	"Average Pond Depth" depicts the actual depth of the pond either measured or estimated. Note: If you know the maximum depth and not the average depth, the Field Examiner's Handbook suggests multiplying the maximum depth by 0.4 to get the average depth, or you can use any method that seems reasonable to attain average depth.	
Pond Capacity (AF)	0.08	Pond Capacity is calculated by multiplying the Pond Surface Area by the Average Pond Depth. If you know the capacity, divide the capacity by surface area and enter the average pond depth in the space above. Note: If pond capacity is determined using a method shown on the "Pond Capacity" sheet, the user may need to modify the value of "Pond Capacity" (cell B9) manually. Note that if the value is modified manually, the formula will be altered for future use.	
Multiple Fill Volume Above Initial Fill to Fulfill From Storage Needs- "Multiple Fills" (AF)	10	The "Multiple Fill Volume Above Initial Fill" is the acre-feet of water required to meet a <i>from storage</i> component if the <i>from storage</i> component exceeds a one time fill. This section should not include the amount of water needed to fill the pond initially or the amount of water needed to maintain the pond level due to evaporation or seepage. For example: If a pond has a capacity of 5 acre feet and 2.5 acre feet of seepage and evaporation, but the pond is used for irrigation that requires 10 acre feet of from storage for the irrigation use, then you would insert 5 acre feet into this location (10 acre feet needed - 5 acre feet from the initial fill = 5 acre feet of additional storage needed). Note: You must have a "From Storage" component exceeding the initial fill on the permit to include a volume in this space.	
Estimated Seepage Loss (AF)	2.9	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.	
Estimated Evaporation Loss (AF)	0.1	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.	
Total Volume Required (AF)	13.1	The "Total Volume Required" is calculated by adding the Pond Capacity, Multiple Fills, Seepage Loss, and Evaporation Loss amounts to determine the total amount of storage required.	
Flow Rate into Pond (CFS)	0.08	The "Flow Rate into Pond" depicts the actual flow, either measured or estimated, into the pond. For offstream facilities, this will be equivalent to "diversion to storage" rate.	
Highest Daily Evaporation Rate From Evaporation Tab. (mm/Day)	4.32	This number is carried over from the "Evaporation Loss" sheet. It is the highest recorded number in the "Precipitation Deficit Table".	
Required Daily Maintenance Volume (AF/Day)	0.01	"Required Daily Maintenance Volume" is the maximum volume of water needed on any given day during the year to maintain pond volume. It is calculated by adding the highest daily evaporation loss to the average daily seepage loss in acre feet. The average daily seepage loss is calculated by dividing the "Estimated Seepage Loss" by 365 days. This is acceptable, since the seepage rate shouldn't vary throughout the season unless the pond completely freezes over during the winter months. The highest daily evaporation loss is calculated by dividing the Highest Daily Evaporation Rate by the 304.8 conversion factor and multiplying this number by the pond surface area to attain a combined daily acre feet requirement.	
Minimum Maintenance Flow (CFS)	0.00	The "Minimum Maintenance Flow" is the minimum amount of flow required to maintain the level of the pond. This number is determined by dividing the "Maximum Required Daily Maintenance Volume" by 1.9835. This flow can be used to determine if the flow rate into the pond is adequate to maintain the pond level.	
Days Required to Fill the Pond	1	The "Days Required to Fill the Pond" is calculated by dividing the "Pond Capacity" by the "Flow Rate" minus "Minimum Maintenance Flow" multiplied by 1.9835. This section will assist you in determining if the flow rate being diverted to the pond is adequate to fill the pond while maintaining the pond level. The length of time to fill the pond will help determine if the flow rate is adequate for the size of pond being proposed. If this number is approximately 6 months (180 days) or more, the reviewer should have a discussion with the applicant to make sure he/she understands that it will take a significant length of time to fill the pond.	