

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 83-11995

Exam Date: 06/29/2023

1. Current Owner:

SHAYNE SKIPWORTH 3688 CANYON CREEK RD OROFINO ID 83544-6099 AND/OR
NORMA SKIPWORTH 3688 CANYON CREEK RD OROFINO ID 83544-6099

2. Accompanied by:

Phone No:

Address:

Relationship to permit Holder:

3. **SOURCE:**

UNNAMED STREAM

Tributary

TIE CREEK

Method of Determination: GIS and field observations**B. OVERLAP REVIEW**

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

YES Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A			

Comments: No overlap concerns

2. Other water rights with the same point-of-diversion:

NO Overlap

Water Right No.	Source	Purpose of Use	Basis
N/A			

Comments: No overlap concerns**C. DIVERSION AND DELIVERY SYSTEM**1. **LOCATION OF POINT(S) OF DIVERSION:**

UNNAMED STREAM L2 (NW¼ SW¼), Sec. 17, Twp 37N, Rge 02E, B.M. CLEARWATER County

Method of Determination: GIS and field observations**PLACE OF USE:** FIRE PROTECTION 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	
37N	02E	17										X							
												L2							
37N	02E	17										X							
												L2							

PLACE OF USE: AESTHETIC 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	
37N	02E	17										X L2							

Method of Determination: GIS and field observations

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.

 x 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.

 x x Aerial Photo Attached (required for irrigation of 10+ acres). x 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
993195	n/a				

Gravity system

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
5 gallon bucket						

2. Measurements: 3 consecutive measurements were made by filling a 5-gallon bucket and timing it. The average flow was 59.89 seconds per 5 gallons, or 0.08 cfs. Note: this is not measuring maximum flow, just the flow at the time of the field examination.

E. FLOW CALCULATIONS x Additional Computation Sheets Attached

Measured Method: Hazen-Williams Equation for pipe flow (see attached)

Permitted Flow: 0.20 cfs

Proof statement flow: 0.20 cfs

Est. maximum flow: 0.205 cfs

RECOMMENDED FLOW: 0.20 cfs

F. VOLUME CALCULATIONS

Aesthetic storage and fire protection storage volumes were calculated using information submitted by permit holder in their proof statement and the *Pond Loss Calculation Spreadsheet* (see attached)

From applicant: Average dimensions of upstream pond: 110' length x 45' width x 4' depth = 0.4545 acre-ft

Average dimensions of downstream pond: 45' length x 45' width x 3' depth = 0.124 acre-ft

Initial fill volume: 0.6 acre-ft

Evap and seepage loss volume: 0.8 acre-ft

RECOMMENDED VOLUME: 1.4 acre-ft

G. NARRATIVE/REMARKS/COMMENTS

Permit 83-11995 authorized Shayne and Norma Skipworth to divert 0.20 cfs from an unnamed stream tributary to Tie Creek for the filling and maintenance of two aesthetic and fire protection ponds. Proof of beneficial use was received on December 19, 2022 and a field examination was conducted on June 29, 2023 with Shayne present.

The source was confirmed to be surface water from an unnamed stream. GPS coordinates were recorded for the POD, but inaccuracies of the device show the POD to be in the SWSW QQ of Section 17, instead of the QQ described in the permit. While the POD is not visible in aerial imagery, Shayne developed the conveyance system to be within the bounds of his property, of which the northwest corner of the property delineates the QQ's. I recommend no amendments to the POD as I believe that reasoning confirms the POD to be L2 (NW¼ SW¼), Sec. 17, Twp 37N, Rge 02E, B.M. CLEARWATER County.

The permit holders' conveyance system consists of a "spring box", which is a perforated and screened 5-gallon bucket buried in the stream, a small cistern that allows for return flow to the stream, 550 ft of 2" pipe, and a road culvert. The Hazen-Williams equation was used to estimate maximum pipe flow during peak flow in the stream. I recommend a rate of 0.20 cfs, which is the permitted flow rate. The fire protection and aesthetic pond is filled from the road culvert, which likely combines stream flow with road runoff. A hydrant is positioned at the downstream end of the pond, on the embankment separating the upstream and downstream ponds. The pond volume calculations were performed with the *Pond Loss Calculation Spreadsheet*. For aesthetic use, I am recommending a fill volume of 0.6 acre-ft and an additional 0.8 acre-ft to account for losses. Since only the upstream pond has a hydrant, I am recommending a fire protection storage volume of 0.5 acre-ft for initial fill and 0.6 acre-ft for refill.

Condition 004 should be carried to license as the fire protection use does not necessarily authorize the fire department to divert from the pond. Conditions x15 and x16 were recommended by Fish and Game and should also remain. Condition 218 limits diversion from the fire protection pond for active fires only and is standardly carried to licensing. Conditions 219 and 220 should be revised to reflect recommended values.

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>
FIRE PROTECTION STORAGE	01/01 to 12/31		1.1 AF
AESTHETIC	01/01 to 12/31	0.20 CFS	
AESTHETIC STORAGE	01/01 to 12/31		1.4 AF
DIVERSION TO STORAGE	01/01 to 12/31	0.20 CFS	

Totals:

0.20 CFS

1.4 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

Blake Burkard -

Field Examiner's Name



Date

3/7/25

Reviewer



Date

3/7/25

Pipe diameter	2 in ▾
Material	Plastic ▾
Roughness coefficient	150
Pipe length	550 ft ▾
Drop	80 ft ▾
Flow velocity	9.42 ft/s ▾
Flow discharge	0.2056 cu ft ▾ /s

Hazen-Williams equation

The Hazen-Williams equation is an empirically derived formula that describes the velocity of water in a gravity flow. Remember that the Hazen-Williams equation is **valid only for water** – applying it for any other fluid will give you inaccurate results. It also doesn't take into account the temperature of the water, and is only accurate for the 40-75 °F (4-25 °C) range.

You can write down this formula as:

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

where:

- v — Velocity of water flowing in the pipe (in m/s for the metric system and ft/s for the Imperial system);
- C — Roughness coefficient;
- R — Hydraulic radius (in meters or feet depending on the unit system) - check the [hydraulic radius calculator](#) to learn more;
- S — Slope of the energy line (frictional head loss per length of pipe). It is unitless, but sometimes expressed in m/m; and
- k — Conversion factor dependent on the unit system ($k = 0.849$ for the metric system and $k = 1.318$ for the imperial system).

Figure 1: Flow calculation

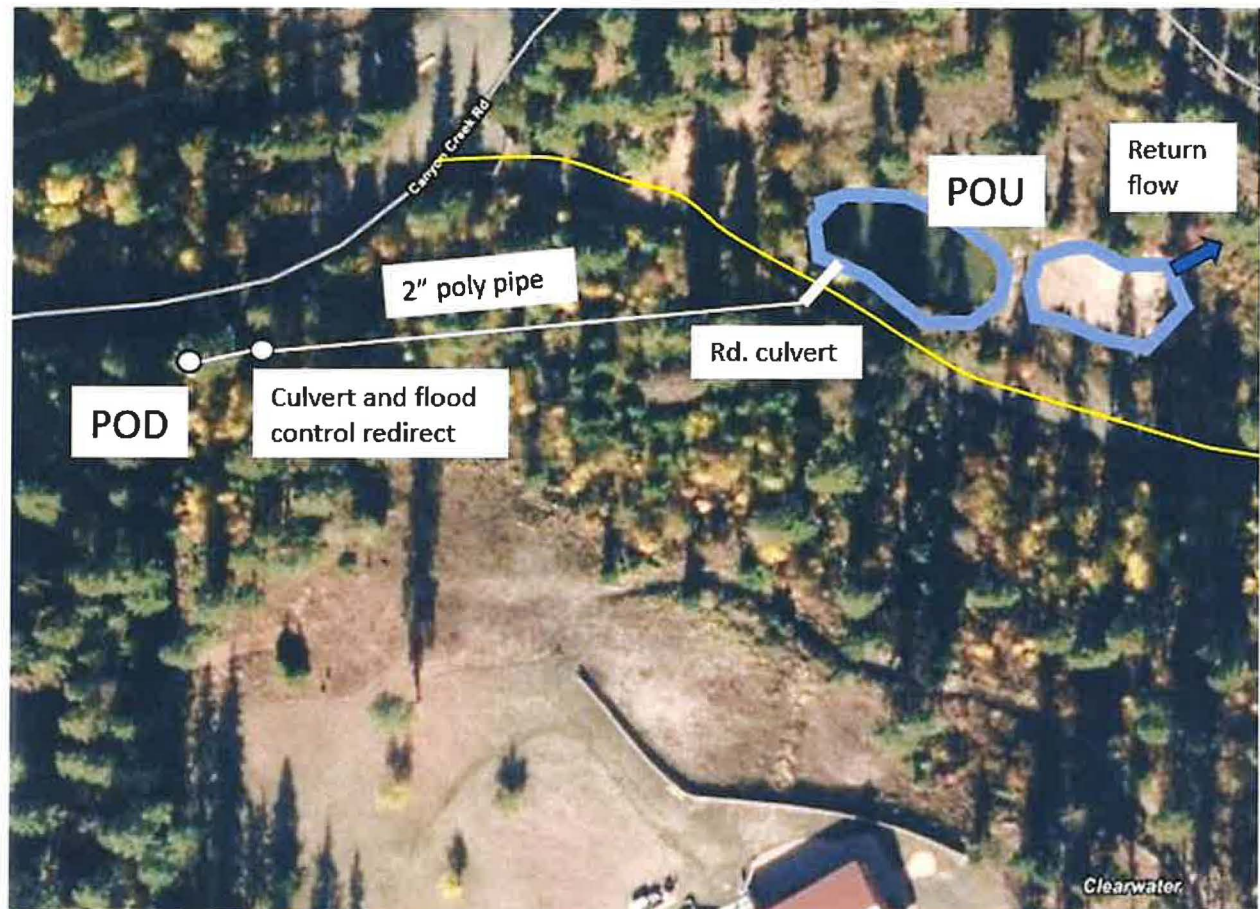


Figure 2: System Diagram



Figure 3: "Spring box" POD with lid and plugs displayed



Figure 4: 16" cistern to allow for redirection back to stream. 2" line in bucket carries water to upper pond



Figure 5: Culvert from which measurement was taken



Figure 6: Pond inflow



Figure 7: Upstream pond and road to hydrant



Figure 8: Fire protection hydrant

Total Storage Calculations

FILE NUMBER	83-11995
REVIEWER	Blake Burkard
DATE	9/1/2023

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
Calculated value
Formula Explanations

Upstream Pond

Surface Area (AC.)	0.1136	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	4	"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)	0.454	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)	0	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)	0.29	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.30	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	1.043	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)	4.74	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)	0.00	"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	3	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.
Days Required to Fill the Pond at 13,000 Gallons per Day	12	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. 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. Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.

Total Storage Calculations

FILE NUMBER	83-11995
REVIEWER	Blake Burkard
DATE	9/1/2023

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User Input
Calculated value
Formula Explanations

Downstream Pond

Surface Area (AC.)	0.041	"Surface Area" is automatically carried over from the "Seepage Loss" sheet.
Average Pond Depth (FT.)	3	"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)	0.123	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)	0	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)	0.10	The "Estimated Seepage Loss" is automatically carried over from the "Seepage Loss" sheet.
Estimated Evaporation Loss (AF)	0.11	The "Estimated Evaporation Loss" is automatically carried over from the "Evaporation Loss" sheet.
Total Volume Required (AF)	0.336	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)	4.74	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)	0.00	"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. <i>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.</i>
Days Required to Fill the Pond at 13,000 Gallons per Day	3	Some water users may want to fill a pond under the 13,000 gallons per day domestic exemption. The "Days Required to Fill the Pond at 13,000 Gallons per Day" is calculated by converting the "Pond Capacity" and the "Required Daily Maintenance Volume" to gallons. The "Pond Capacity" is then divided by 13,000 gallons minus the "Required Daily Maintenance Volume" in gallons to determine the number of days to fill pond. <i>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.</i> Negative values indicate that the supply of 13,000 gallons per day is not enough volume to overcome the required daily maintenance volume; the pond will never fill.